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The Problem of Back Flow Preventive Measures Employed at the New York World's Fair

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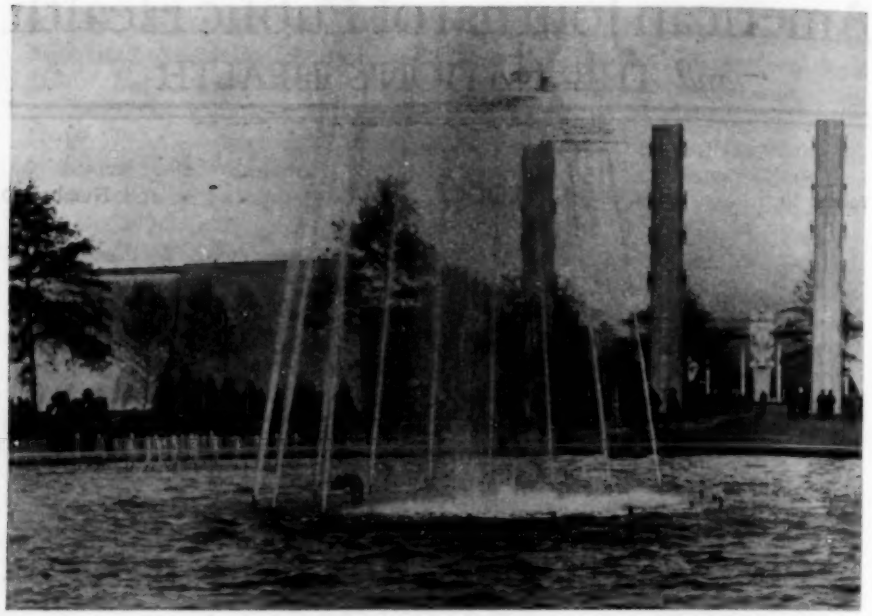
MUCH has been written in recent years concerning the possibility of contaminating the water supply as the result of back-siphonage or back flow in plumbing systems. Many surveys have been made for the purpose of uncovering and eliminating interconnections between water distribution and plumbing systems which are hazards to the safety of the water supply because they may permit the back flow of wastes when abnormal conditions occur in the piping systems.

One of the most comprehensive of these surveys was that made by the U. S. Public Health Service and the Works Progress Administration in 1936 and 1937. More than 800 buildings in New York City and approximately 100 buildings in Detroit, Mich., were inspected for cross-connections and interconnections as well as other faulty plumbing.[1] This survey and many others were prompted by the severe water-borne outbreak of amebic dysentery in Chicago in 1933 which resulted in at least 1,409 cases of the disease with 98 or more fatalities.[2] The epidemic was attributed directly to interconnections in the plumbing systems of two hotels which permitted the back flow of sewage into the water distribution systems.

A more recent plumbing-borne outbreak of disease which again emphasized the necessity for providing adequate protection against back flow is that which occurred in a laboratory building on the campus of Michigan State College in East Lansing, Mich., during December, 1938, and January, 1939.[3, 4] Here again some 80 cases of brucellosis, resulting in one student death, were attributed to a contaminated water supply caused by back flow into the water distribution system.

Despite these continued plumbing-borne outbreaks of disease and the many excellent surveys made to discover and eliminate faulty plumbing, only a limited amount of information has as yet found its way into the literature concerning what is being done in actual practice to protect water distribution



GOOSENECK INLET TO DISPLAY FOUNTAIN AND POOL

An accepted method of supplying a display fountain and pool is illustrated by the gooseneck inlet in the picture. The 4 inch inlet from the domestic water supply is not only well above the water level in the pool but is also above the topmost rim of the pool so that it cannot become submerged under any circumstances.

The numerous fountain nozzles are part of a separate recirculating system which is supplied directly by the water in the pool. There is no connection whatever between the domestic water supply and the fountain recirculating system.

systems against back flow. Many rules and regulations prohibiting cross-connections and interconnections have been formulated and adopted by various states and cities, but the extent to which these regulations are being enforced is too little known. Hence, it is the purpose of this paper to attempt to stimulate further contributions concerning the efforts being made and the accomplishments achieved toward the protection of the water supply against contamination as the result of back flow.

PREVENTIVE MEASURES AT THE NEW YORK WORLD'S FAIR

The building of the New York World's Fair provided an excellent opportunity to apply the provisions of the New York City *Building Code* pertaining to the prevention of back flow to new construction work. It was decided at the outset that the many water systems at the Fair must be adequately protected against contamination from back flow in practical compliance with the spirit of building the "World of Tomorrow." In other words, no precautions were to be overlooked in safeguarding the water supply for the millions of persons from all over the world who were to visit the Fair.

The enforcement of the requirements relating to back flow was assumed by the World's Fair Department of Health in fulfillment of its responsibility for the protection of the water supply against contamination. The regulations providing for the protection of the water supply were found in the following two general requirements of the *Building Code:*

1. Every structure intended for human occupancy shall be provided with a supply of pure and wholesome water, neither cross-connected with unsafe water supplies nor interconnected to any drainage system.

2. Wherever the supply to a fixture is introduced into the fixture below the overflow level the supply shall be protected with an approved vacuum breaker which will prevent the siphoning of water from the fixture into the supply piping.

These two relatively simple requirements when properly interpreted were sufficient to cover adequately every plumbing problem involving back flow encountered at the Fair.

EXAMINATION OF PLUMBING PLANS

A systematic check of the building plans and all other plans involving plumbing work, such as for display fountains and water spectacles, was made in accordance with regulations of the *Building Code* mentioned above. Copies of all plumbing plans were submitted to the Department of Health and carefully examined for plumbing hazards. These deficiencies included cross-connections between the city water supply and unsafe recirculated fountain and pool supplies, such as pump priming or submerged pool connections; interconnections between water and waste systems, either direct or by way of various water cooled equipment; and submerged inlet fixtures including water closets, urinals, flush tanks, make-up tanks, dishwashers, steam tables, and other kitchen equipment. Other violations of the plumbing code, not pertaining to back flow but considered to be health hazards, in addition to dangerous locations of exposed soil and waste lines above kitchens or other rooms where food is handled, were also listed for correction.

DRINKING FOUNTAINS

Particular attention was paid to the design of drinking fountains. Although a poorly designed drinking fountain cannot be classified as a plumbing violation unless it is constructed with a submerged inlet or is not provided with a trap, the fountain may easily be a factor in the transmission of disease and hence must be considered along with other plumbing fixtures.

Thus a fountain with a vertical jet allows water from the mouth of the

DRINKING FOUNTAIN

The picture illustrates one of the drinking fountains accepted for use at the World's Fair. Note especially the nozzle set above the edge of the bowl so that it will not be submerged should the drain of the fountain become clogged and allow the bowl to fill with water. Note also the non-oxidizing guard to prevent the mouth and nose of persons using the fountain from coming into contact with the nozzle.

The jet of water issues from the nozzle at an angle so that the mouth of the user is to the left of and not directly above the guard and the water inlet. In this way water from the mouth of the person using the fountain falls into the bowl rather than back upon the inlet and the guard, and thus reduces to a minimum the possibility of transmitting infection from one individual to another.

The "Essential Features in the Design of Sanitary Drinking Fountains" as adopted by the American Public Health Association were used as a guide for the acceptance of all drinking fountains installed at the Fair.

person using the fountain to fall back upon the orifice from which it issues, so that any disease organisms from the mouth of that person may be transmitted to the next one drinking at the fountain. In order to eliminate this fault in design, the nozzle of the fountain should be set at an angle from the vertical and should be protected by a non-oxidizing guard so as to prevent the mouth of the user from contaminating the nozzle directly. In addition, the guard should be so designed as to reduce to a minimum the possibility of transmission of infection by touching the guard.

The "Essential Features in the Design of Sanitary Drinking Fountains"[5] as adopted by the American Public Health Association were used as a guide for the approval of drinking fountains installed at the New York World's Fair.

Diagrams of drinking fountains with self-contained refrigerating units were required since many of these units are equipped with water cooled condensers and hence must be provided with an indirect waste connection. The usual practice in making these installations is to connect a small branch from the water line supplying the fountain to the condenser unit, and thence to connect the cooling water waste line directly to the drain, thereby creating a very dangerous inter-connection between the water distribution and the waste systems.

LETTERS TO CONTRACTORS

As each set of plans was examined the plumbing deficiencies were listed and a letter of notification was sent to the contractor or other responsible authority. The letter called attention to the fact that the safety of the water supply on the Fair grounds was a direct responsibility of the Department of Health, and those sections of the *Building Code* pertaining to the protection of the water supply were quoted in full. Following the explanation, the plumbing deficiencies which could lead to the contamination of the water supply were listed and the proper method of correction indicated for each deficiency.

Since many of the building plans examined contained violations similar in character and manner of correction, a representative list of "Requirements for the Protection of the Water Supply against Contamination as the result of Back Flow" was prepared. The "Requirements" were divided into two groups: those pertaining to plumbing in all buildings, and those pertaining in particular to kitchen equipment. The list of "Requirements" pertaining to all buildings included the following:

1. All flush valve supplied fixtures with submerged inlets such as water closets and urinals must be equipped with an approved vacuum breaker so installed as to prevent back flow from the fixture into the water distribution system.

2. Flush tanks with ballcock controlled supplies must be equipped with an approved anti-siphon inlet which shall be set at least 1 inch above the overflow outlet of the flush tank.

3. Ballcock controlled inlets to water reservoirs of air washers, dehumidifiers, economizers, make-up tanks, etc., must be properly protected against back flow. This is accomplished most effectively by elevating the inlet so that it will be at least twice the diameter of the inlet above the highest possible water level in the fixture considering the overflow to be clogged so as to be ineffective. If the inlet cannot be properly elevated, then an approved vacuum breaker must be installed in the supply line at a point at least 6 inches above the topmost rim of the water reservoir.

4. Water supply inlets to lavatories, sinks, and all other fixtures shall be located at least twice the diameter of the inlet above the topmost rim of the fixture. Where a submerged inlet is absolutely essential to the proper functioning of a fixture, an approved vacuum breaker must be installed in the supply line at a point at least 6 inches above the topmost rim of the fixture.

5. Indirect waste connections must be provided from water cooled condensers of air conditioning and refrigeration units. The waste line from the unit must be terminated at a distance of not less than two pipe diameters above the topmost rim of the open

waste receptacle into which it discharges. Condenser water may not be re-used for domestic purposes under any circumstances.

6. Direct connections of the city water supply to recirculating pumps, sump pumps, or similar purpose pumps are prohibited. Where water connections are absolutely essential for priming or other purposes, the water connection must be made to the suction side of the pump and an approved vacuum breaker and check valve must be properly installed in the supply line not less than 6 inches above the highest point in the pump circulating system.

7. Pool and fountain inlets must be adequately protected against back flow. In general, the supply must empty into the pool at a distance of not less than twice the diameter of the supply line above the topmost rim of the pool.

8. All drinking fountains must comply with the "Essential Features in the Design of Sanitary Drinking Fountains" as adopted by the American Public Health Association.

In addition to the above regulations, another list of "Requirements for the Protection of the Water Supply against Contamination as the result of Back Flow" with particular reference to kitchen equipment included the following items:

1. Over rim inlets must be provided in dish and glass washing machines. Many of the latest models of these machines are still constructed with submerged inlets through which contaminated water from the machines may readily be siphoned back into the water distribution system. (Any inlet which is below the highest possible water level in the machine, considering the overflow line to be clogged so as to be ineffective, is a submerged inlet.) This defect may be corrected by providing goose neck fillers which empty into the water reservoirs in the machines at least 1 inch above the highest possible water level as defined above.

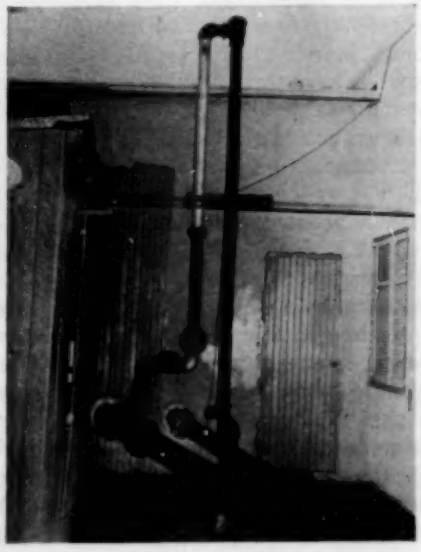
2. Steam tables and bain-maries are also commonly constructed with submerged inlets below the topmost rim of the water receptacle. This defect may be corrected by providing a goose neck filler emptying into the water receptacle from a point not less than 1 inch above the topmost rim of the fixture.

3. Disher vats with submerged inlets are also unacceptable. These must also be provided with goose neck fillers as for the steam tables.

Copies of the "Requirements" were enclosed in each letter listing the plumbing deficiencies thereby avoiding much duplication of work.

INTERVIEWS

Upon receipt of the letter concerning the plumbing deficiencies many of the contractors and plumbers made arrangements for interviews both in the office and in the field. Many of them were totally unfamiliar with the hazards of

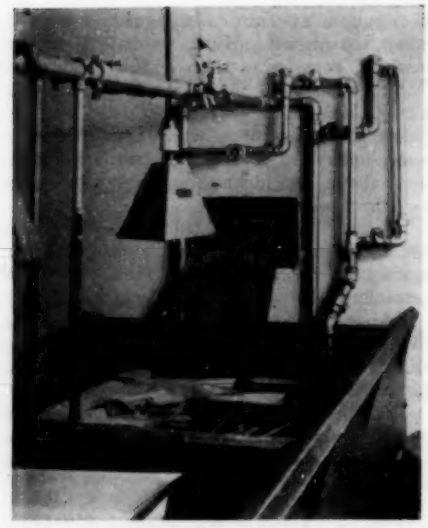


AQUACADE SWIMMING POOL CONNECTION

In order to safeguard the city water supply against contamination, the 4 inch vacuum breaker shown at the top of the loop was especially made and installed on the city water connection for back-washing the swimming pool filters at the Aquacade. This installation was necessary because of a lack of space required for a separate over rim supplied tank and pump to back-wash the filters.

The 4 inch city supply is connected into the 8 inch suction line to the pool recirculating pump just ahead of the pump which is located inside the doorway. The vacuum breaker is mounted at least one foot above the highest point in the filtration system (indicated by the roof level in the picture) so that under no circumstances will there be any static back pressure which would tend to keep the seat of the vacuum breaker in a closed position. The check valve just ahead of the gate valve provides another safeguard against the same possibility.

Note that the gate valve is placed on the discharge side of the vacuum breaker and must be closed when the pool recirculating pump is in operation, otherwise air will be sucked in through the vacuum breaker and the pump will lose its prime.



PHOTOGRAPHER'S DEVELOPING SINK

Many developing sinks as the one shown in this picture contain a submerged rim spray water supply. In all such installations the domestic supply must be protected against possible contamination as the result of back flow of any of the various developing mixtures from the sink into the water system. This has been accomplished by the installation of vacuum breakers and check valves in the hot and cold water lines supplying the submerged rim spray entering at the right hand corner of the sink.

cross-connections, interconnections, submerged inlets, and deficient fixtures, and even more so regarding the regulations of the *Building Code* prohibiting these hazards which had been in force since January 1, 1938. After the reasons behind these regulations had been carefully explained, however, very good coöperation was obtained.

As usual, there were some who stubbornly resisted the changes required, thinking only of the extra expense involved without considering the possible dangers to the safety of the public health which existed because of the plumbing deficiencies. They were the ones, however, who had taken it for granted that positive pressure always exists in water systems. When it was demonstrated to them that there would be times when there was no pressure or even a negative pressure (vacuum) under adverse operating conditions in water distribution systems, even these few admitted the necessity and wisdom of the *Code* regulations providing for the protection of the water supply against all possible contingencies. The slight extra expense involved in most cases was negligible in contrast to the factor of safety added to the protective measures taken to preserve the public health of the millions of visitors to the Fair.

By way of contrast, some of the plumbers became "vacuum breaker minded" as evidenced by a number of unnecessary installations observed during subsequent plumbing inspections.

The plumbing deficiency letters did not always bring forth response from the contractors. In these instances, the plumbers were contacted directly in the field and the plumbing deficiencies pointed out to them together with the attendant hazards to the safety of the water supply. Very often this was all that was necessary to bring about compliance with the *Code* requirements. In other cases it was necessary to delay acceptance of the plumbing installation by the Department of Health until the necessary corrections had been made.

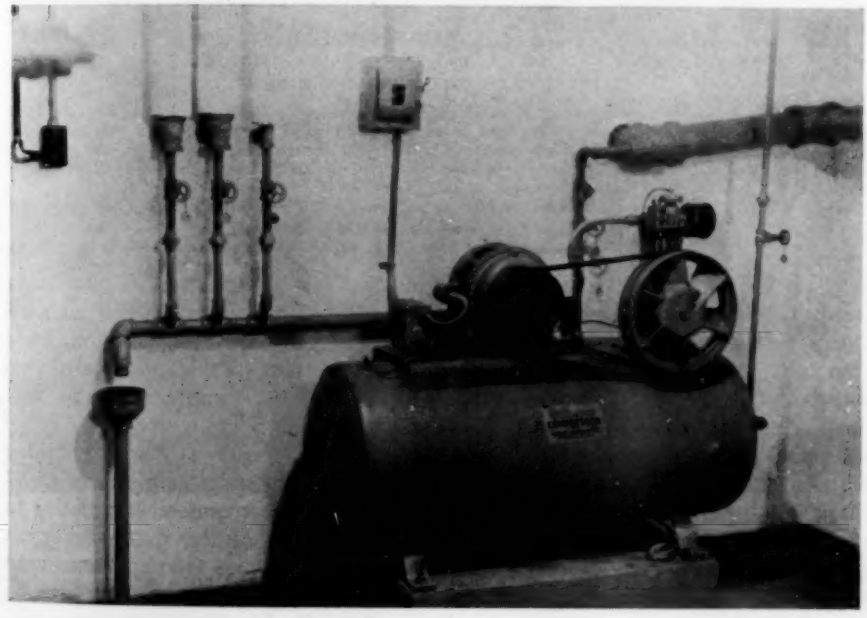
FIELD INSPECTION

As previously mentioned, field inspection of the plumbing was maintained during all stages of the construction period. This procedure was absolutely necessary because of the constant revision of plans and changes in equipment for one reason or another. Also, the installation of vacuum breakers and other protective devices was a new experience to many of the plumbers so that the proper manner of installation was not always clearly understood. Thus, vacuum breakers were placed in the water lines upside down, sideways, and below the overflow level of the fixtures they were meant to protect from back flow. This was done usually because of a lack of knowledge concern-

ing the construction and operation of the vacuum breaker. Many looked upon it as a new device similar to a pressure relief or blow-off valve when in reality the vacuum breaker is constructed to relieve the effects of a lack of pressure rather than an excess of pressure.

Besides the vacuum breaker, another protective device which was constantly rendered ineffective is the indirect waste connection required for various water cooled equipment. It was readily understood that an open waste was necessary but usually the cooling water waste line was then submerged in the open funnel or other waste receptacle into which it discharged. The necessity of providing a safe air gap between the end of the cooling water waste line and the top rim of the open waste receptacle was not recognized.

Even after the buildings were completed constant re-inspection of the plumbing was required. Many of the building superintendents and maintenance men who were placed in charge of the buildings after completion were unfamiliar with the protective devices and installations. As a result, vacuum breakers were removed because they leaked and were not replaced or properly repaired; indirect waste lines were extended down into open drain receptacles in order to prevent splashing instead of providing a loose protective shield; over rim inlets were often nullified by connecting a piece of rubber

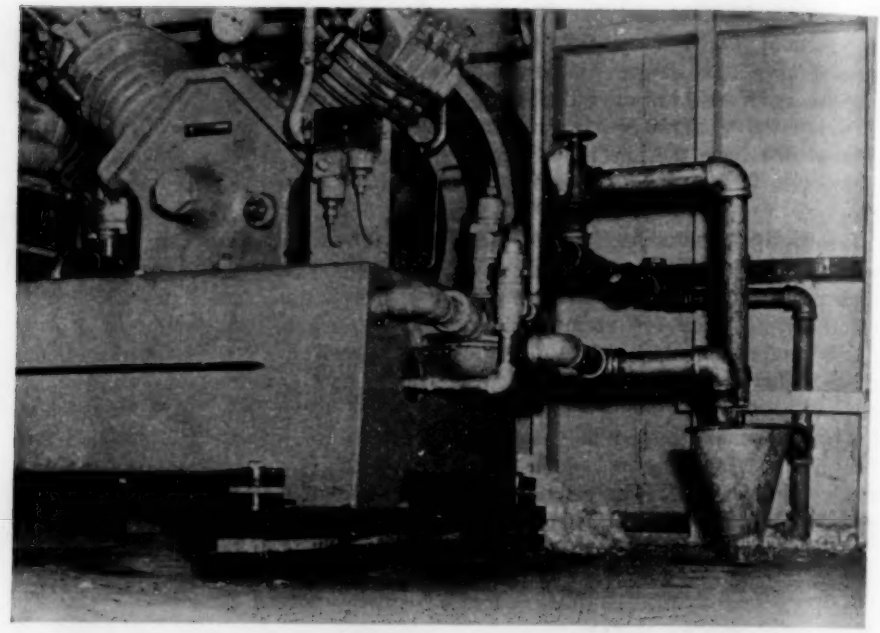


INDIRECT WASTES

At the left of the picture may be seen three drip lines for draining the cold water, the hot water and the hot water recirculating systems of the building. An accepted method of wasting these lines into an open funnel is illustrated. This arrangement eliminates the possibility of contaminating the domestic water system as the result of back flow which might occur if the drip line were directly connected to a drain or sewer line.

At the rear of the compressor unit may be seen another drip line from the fire system which carries the same water supply as the domestic system. This drip also connects into the 1¼ inch drain leading to the open funnel waste. Note that the drain empties into the funnel well above the top rim.

The air compressor unit shown has no water connection.



WATER COOLED AIR-CONDITIONING UNIT

This picture illustrates a water cooled air-conditioning unit properly installed so as to protect the water supply against possible contamination. The unit is supplied with water through the 1½ inch valved line emerging from below the floor between the studding in the right background. Installed on the water line between the valve and the unit may be seen a check valve (visible behind waste line from relief valve to funnel) and a pressure relief valve, as required by the New York City Building Code.

The waste line from the water cooled condenser of the air-conditioning unit empties into the open funnel at a safe distance above the top rim. Note the waste cooling water discharging above the funnel.

hose to the inlet which was then submerged below the top rim of the fixture. Other similar instances too numerous to mention were also noted and subsequently corrected.

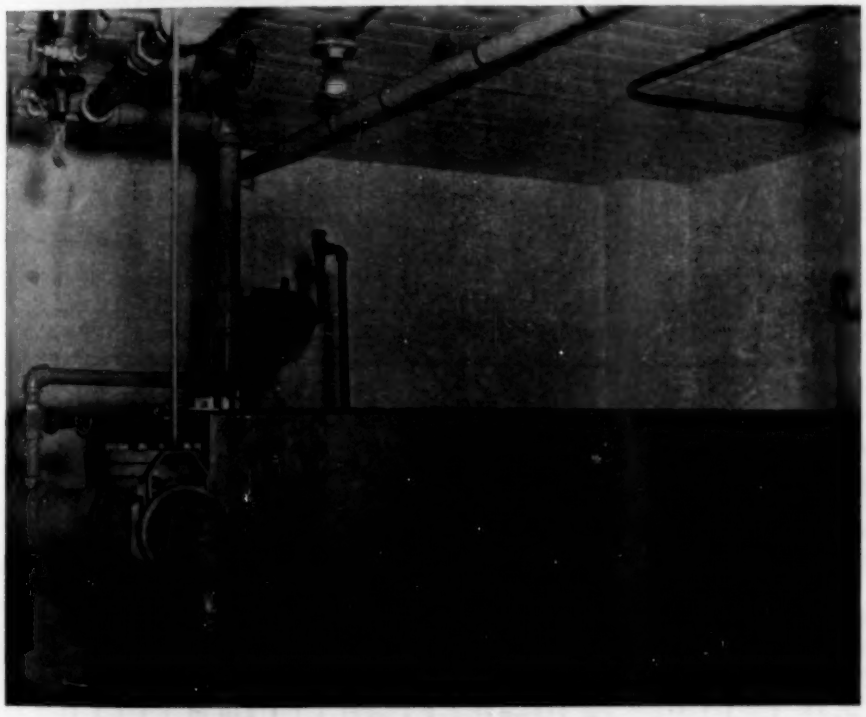
Besides these periodic re-inspections new construction and alteration work requiring constant inspection continued throughout the 6 month operating period of the season. Much follow-up work was necessary in checking back on the correction of plumbing deficiencies of which the various exhibitors and concessionaires had been notified by letter. In many cases the changes were made directly by the building maintenance men, and in other cases the plumbers, air-conditioning contractors, equipment manufacturers, or others were required to make the corrections so that their work was in compliance with the plumbing code. This was possible by reason of the fact that most of the contract specifications stated that all work must comply with the New York City *Building Code*.

Although there was much opposition at first to the strict enforcement of all plumbing code requirements relating to the protection of the water supply, as the reasons behind the regulations were pointed out the measure of coöperation on the part of architects, engineers, and especially the plumbers increased steadily. During the final three or four months before the opening of the Fair, the rush was so great to complete the work by opening day that many deficiencies were neglected so that correction was necessary after the plumbing

work had been completed. Since letters listing the plumbing violations had already been sent to the various building contractors, follow-up letters were again sent wherever re-inspection indicated that the plumbing corrections had not been made.

NUMBER OF PLANS EXAMINED

A total of 483 different sets of building and exhibit plans were examined by the Sanitary Division of the World's Fair Department of Health for cross-connections, interconnections, submerged inlet fixtures, and other plumbing deficiencies. The types of plans examined for each building or exhibit included water distribution systems, soil, waste, and storm water drainage systems; heating, refrigerating, and air-conditioning systems; display fountain recirculating systems; kitchen and laboratory fixture layouts, and cross-section diagrams of air-conditioning units, re-



MAKE-UP TANK

Tanks for supplying make-up water to pools, fountains, and other displays using a recirculated supply of water are often installed with a submerged ballcock inlet. Obviously, such submerged inlets are an ever present hazard to the safety of the domestic water supply, especially when the recirculated water is used in outdoor pools and fountains where it is subject to many possibilities of contamination.

The tank shown in the picture supplies make-up water for a series of fountains and pools served by a single recirculating system. The 2 inch inlet is mounted 4 inches above the top-most rim of the tank so that there is no possibility of back flow of the unsafe water in the tank into the domestic supply. The ballcock control is mounted on the bottom of the ½ inch pipe which loops upward and then down into the tank from the right side of the 2 inch inlet. Note the vacuum breaker at the top of the loop as shown to protect the submerged control line.

The isolation of the domestic water supply from the make-up tank water was doubly important in this instance not only because of the chances of contamination of the recirculated water in the outside fountains and pools, but also because the water was heavily dosed with copper sulphate to give it a blue color and to control algae growths.

The 1 inch valved line extending into the tank at the front left hand corner is from the recirculating system and hence needs no protection.

NEW YORK WORLD'S FAIR

DEPARTMENT OF HEALTH

X-Y-Z Building — District #6 — Location R-1

X-Y-Z Restaurant — PLUMBING SURVEY — Date 10-19-39

KITCHEN EQUIPMENT	NO.	CHECK VALVE NO.	CHECK VALVE SIZE	VACUUM BREAKER NO.	VACUUM BREAKER SIZE	OVER RIM INLET GR.	OVER RIM INLET F.	INDIRECT WASTE	REMARKS
Dishwashers	1					2		Yes	To grease trap
Glass Washers	1						1	Yes	
Bain-Marie	1							Yes	Hand filled
Soup Kettles	1	1	1/2				1	Yes	
Steam Tables	1						1	Yes	
Fisher Vats	1							Yes	
Coffee Urns	1	1	3/4					Yes	
Potato Peelers	1	1	1/2					Yes	
Sinks	9						9	Yes	2 sinks to grease trap
Hot Water Tanks	1	(Also 1 steam boiler)						Yes (2)	Relief to funnel
Bar sinks	2							No	
TOTALS	20	3	-	-	-			19	

REFRIGERATING UNITS (WATER COOLED)	NO.	CHECK VALVE NO.	CHECK VALVE SIZE	VACUUM BREAKER NO.	VACUUM BREAKER SIZE	RELIEF VALVE NO.	RELIEF VALVE SIZE	INDIRECT WASTE	REMARKS
A-B-C units	2	No						Yes	No check valves
TOTALS	2							2	

AIR CONDITIONING UNITS (WATER COOLED)	NO.	CHECK VALVE NO.	CHECK VALVE SIZE	VACUUM BREAKER NO.	VACUUM BREAKER SIZE	OVER RIM INLET GR.	OVER RIM INLET F.	INDIRECT WASTE	REMARKS
Compressor - Condenser Type									
See Building									
TOTALS									

TOILET ROOM FIXTURES		FLUSH VALVES W. C. NO.	FLUSH VALVES W. C. V.B.	FLUSH VALVES URINALS NO.	FLUSH VALVES URINALS V.B.	FLUSH TANKS W. C. NO.	FLUSH TANKS W. C. V.B.	FLUSH TANKS URINALS NO.	FLUSH TANKS URINALS V.B.	LAV. OVER RIM INLETS	REMARKS
PUBLIC TOILETS	Men	2	2	2	-					2	Stall type urinals
	Women	3	3							2	
FOOD HANDLERS TOILETS	Men	3	3	2	2					2	2 Showers
	Women	3	3							2	2 Showers 1 S.S.
TOTALS		11	11	4	2					8	

Overhead Soil or Waste Lines	No.	How Protected
Location: Home		

SUMMARY	CHECK VALVES	VACUUM BREAKERS	RELIEF VALVES	OVER RIM INLETS	INDIRECT WASTES	FL. V. W. C.	V. B.	FL. T. W. C.	V. B.
TOTAL NO.	3	-	2	73	21	11	2	-	-

R.J.G.

NEW YORK WORLD'S FAIR 1939 INCORPORATED

DEPARTMENT OF HEALTH

X-Y-Z Building — District #6 — Location R-1

PLUMBING SURVEY — Date 10-19-39

WATER INLETS	NO.	CHECK VALVE NO.	CHECK VALVE SIZE	VACUUM BREAKER NO.	VACUUM BREAKER SIZE	OVER RIM INLET GR.	OVER RIM INLET F.	INDIRECT WASTE	REMARKS
Pools									
Fountains	1	Not in operation - water line disconnected.							
Make-up Tanks	1					1		Yes	Cooling tower make-up tank
Pumps (Priming)	(1)	Self-primed							Cooling tower requirs. pump
H. W. Tanks	1							Yes	In bsmt. Relief o.k.
Sinks	1						1	Yes (1)	In bsmt. Takes ind. waste line from kitchen fixtures
Sump (In refrig. room)		Drips from city water						Yes (2)	and fire systems terminate above sump.
TOTALS	4					1	1	5	

REFRIGERATING UNITS (WATER COOLED)	NO.	CHECK VALVE NO.	CHECK VALVE SIZE	VACUUM BREAKER NO.	VACUUM BREAKER SIZE	RELIEF VALVE NO.	RELIEF VALVE SIZE	INDIRECT WASTE	REMARKS
See Restaurant									
TOTALS									

AIR CONDITIONING UNITS (WATER COOLED)	NO.	CHECK VALVE NO.	CHECK VALVE SIZE	VACUUM BREAKER NO.	VACUUM BREAKER SIZE	OVER RIM INLET GR.	OVER RIM INLET F.	INDIRECT WASTE	REMARKS
Compressor - Condenser Type	2	(Compressors air cooled - condensers cooled by water from (repirc. supply from cooling tower - see above.							
Chilled water system		1	2"	1	2"	Direct make-up connection - city water.			
TOTALS	2	1		1					

TOILET ROOM FIXTURES		FLUSH VALVES W. C. NO.	FLUSH VALVES W. C. V.B.	FLUSH VALVES URINALS NO.	FLUSH VALVES URINALS V.B.	FLUSH TANKS W. C. NO.	FLUSH TANKS W. C. V.B.	FLUSH TANKS URINALS NO.	FLUSH TANKS URINALS V.B.	LAV. OVER RIM INLETS	REMARKS
PUBLIC TOILETS	Men	10	10	8	8					7	1 S.S.
	Women	13	13							7	1 S.S.
PRIVATE TOILETS	Men	4	4	3	3					4	4 Showers
	Women	4	4							4	1 S.S.
TOTALS		31	31	11	11					22	

DRINKING FOUNTAINS	NO.	INLET	DRAIN	CHECK VALVE NO.	CHECK VALVE V.B.	VACUUM BREAKER NO.	VACUUM BREAKER V.B.	INDIRECT WASTE	REMARKS
Fountain Type									
Cooler Type	4	O.K.	O.K.					No	Air cooled units.
TOTALS	4								

SUMMARY	CHECK VALVES	VACUUM BREAKERS	RELIEF VALVES	OVER RIM INLETS	INDIRECT WASTES	FL. V. W. C.	V. B.	FL. T. W. C.	V. B.
TOTAL NO.	1	1	1	24	5	31	11	-	-

R.J.G.

frigerating units, and other special equipment.

Three hundred and eleven plumbing letters were sent to contractors relative to changes and corrections. In some instances two or three letters were required before any response was obtained, and in many cases it was necessary to contact the responsible authorities in the building before any action was taken.

TYPICAL PLUMBING INSTALLATIONS

Some typical examples of protective devices and methods used in safeguarding the water supply at the New York World's Fair against contamination as the result of back flow are shown in the accompanying illustrations.

PLUMBING SURVEY

During the last two months of the Fair season a systematic check-up of the plumbing in every building was made. All fixtures supplied with water were recorded for each building together with the protective devices employed for the prevention of back flow. The plumbing survey revealed many changes which had been made subsequent to the original work as well as many new installations of additional air-conditioning and refrigerating units. All changes or additions which did not comply with the necessary requirements of the *Code* were marked for correction.

In order to facilitate the survey work, form sheets on which the number and type of all fixtures could readily be entered were used. Two types of form sheets were drafted, one for restaurant equipment and the other for general building equipment including pumps, make-up tanks, fountains and the like. Space is also provided on both sheets for recording refrigerating units, air-conditioning units, toilet room fixtures, and finally, a summary of all protective devices for the building or establishment (see sample Plumbing Survey sheets).

The survey has provided a permanent record of the plumbing for each building and, incidentally, it revealed the number of possible points at which contamination of the water supply could occur without proper protection. This record will prove invaluable in rechecking the plumbing systems and fixtures when the buildings are re-opened for the 1940 season. Some idea of the magnitude and scope of the survey may be gained by the summary of fixtures, equipment, and protective devices installed in the buildings, exhibits, and displays on the site of the World's Fair (Table 1).

SUMMARY

The assumption of the responsibility for examining all plumbing plans for new construction in order to eliminate all possible sources of contamination of the water supply represents a modern trend in the conception of the duties of the Department of Health. It is true that numerous inspections are made to uncover and to eliminate faulty plumbing in buildings already completed, but the idea of assuming the initiative for eliminating plumbing hazards before they are constructed in order to save expensive alterations and replacements is still unique in the experience of a health department. It represents a distinct and valuable service rendered both to private interests including architects, engineers, and contractors on the one hand, and to the general public on the other in instituting a more efficient and effective means of attacking one of the major public health problems, namely, that of safeguarding the water supply against accidental pollution.

While constant inspection for plumbing deficiencies in hospitals, institutions, hotels, industrial plants, apartment houses, and other buildings should be carried on by the health department, it seems that a very effective preventive measure is being overlooked in not pro-

TABLE 1

PLUMBING SURVEY SUMMARY

Toilet Room Fixtures		
Water closets		
Flush valve	3,649	
Flush tank	146	
Total		3,795
Urinals		
Flush valve	1,241	
Flush tank	15	
Total		1,256
Lavatories		
Total		2,520
Air-Conditioning Units		
Water-cooled condenser units	176	
Evaporative condenser units	41	
Air-cooled units	35	
Total		252
Refrigeration Units		
Water-cooled condenser units	217	
Evaporative condenser units	2	
Air-cooled units	73	
Total		292
Drinking Fountains		
Outside fountains	328	
Inside fountains	205	
Total		533
Protective Devices		
Vacuum breakers		
Flush valve	4,673	
All other	111	
Total		4,784
Anti-siphon inlets		
Flush tanks	139	
Over rim inlets		
Lavatories	2,520	
All other fixtures	2,373	
Total		4,893
Indirect wastes		
Total		1,368

viding for the examination of all plumbing plans for new construction work. In this way, many violations may be prevented or corrected in the planning stage. Likewise, the detection of plumbing deficiencies on the plans may be accomplished much more quickly and effectively than by subsequent field inspection after the plumbing is installed and either partially or wholly enclosed in the walls and ceilings of a building. However, plans are oftentimes altered during construction for various reasons so that subsequent inspection is always necessary both for checking the plumbing system and to see that corrections are made and that required protective devices are properly installed.

The authority for investigating the safety of the plumbing in buildings is vested in the Department of Health by the provisions of the *Administrative Code* of the City of New York in Chapter 22, Sections 564–18.0 and 564–32.0.

The elimination of all public health plumbing hazards at the New York World's Fair was carried out by the author with the aid of two assistant engineers by direction of Dr. John G. Grimley, Special Deputy Commissioner of the New York City Health Department for the Fair.

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Responsibility of Organized Medicine in Medical Care*

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THE responsibility of organized medicine for medical care seventy-five years ago was approximated one hundred per cent. Since then a number of factors have appeared which leave the definition of this responsibility less clear. Such factors include the public health service, the trained nursing service, medical-social workers, organized industrial medicine, government care of the chronically ill, and a significant change in a health-minded public's attitude toward its rights in the matter of adequate medical care.

Meanwhile organized medicine has plodded along, jealously guarding some of its traditional practices, making concessions in others, usually trailing rather than leading in the changes that have occurred in the evolution of medical care. Mark carefully that this does not apply to individual physicians who have been fundamentally responsible for most of the sound progress in the above fields related to medical practice. We need only mention such names as Stephen Smith, Welsh, Delafield, Biggs, Gorgas, and the like, to convince ourselves that a full sense of the physician's responsibility for medical care of all the people has found a lively abiding place in such minds as theirs.

The psychologists long since discovered that an organization is something different from the sum of the individuals of which it is composed. There is a mob psychology which is not epitomized in any single member of the crowd. Organize a professional group and you produce an effect on its members alien to each as an individual but which becomes the common property of the group and may warp its thinking. The worst result of such organization is the tendency to stress "rights" rather than "responsibilities." This has been a notable shortcoming in many of the pronouncements of organized medicine as expressed through American Medical Association spokesmen.

There is nothing about rights in the title of this paper. Any discussion of them would lead us too far afield. I shall take it for granted that we all agree that in 1850 medical care of the people was both a *responsibility* and a *right* of the medical profession. There was nobody then to challenge this status. Today, however, laws have stepped in to define rather closely the doctor's rights; and new social forces, new medical discoveries, new and accepted government controls have appeared to assume at least part of the responsibility that once was exclusively his.

Under totalitarian rule full respon-

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sibility for medical care has been assumed by government. Organized medicine as well as the public health service is centrally directed by a council, trained or otherwise, from whose orders there is no appeal. On the other hand, in our democracy responsibility for medical care may have been allowed to go a bit too much at loose ends. This was perhaps unavoidable under a system where, until recently at least, the principle has prevailed that the less government we have the better governed we shall be.

Somewhere between these two concepts of responsibility for medical care lies a better way. Search for that way is engaging the attention of many able minds in our country. At the present time organized medicine is beginning to find it is profitable to think less of its *rights*, and more important to assume leadership in taking upon itself its *responsibilities* for medical care in the light of our modern social structure.

To do this, organized medicine is showing a tendency to go to school and study with a somewhat more liberal vision its place in the community of today. It looks with less heat and with more sympathy and understanding on the other official and social organizations lately come into the field which have the power to be medicine's staunch allies, but which at times and with some reason have proved themselves unkindly critics. In short, organized medicine is realizing that although it is an indispensable part of modern society, nevertheless social evolution has struck a pace hitherto unknown, a pace quite foreign to the dignified and deliberate traditions of medical practice. Today the doctor must be a citizen first and must understand the demands of citizenship as well as those of his profession. Organized medicine's first responsibility in medical care, then, is to insist that its members gain a clearer understanding of the changes in social structure which this century has produced.

Of the several social forces which have arisen in recent years to nudge organized medicine out of its accepted traditions of practice, effective popular health education is in some ways the most insistent of all. While organized medicine has remained largely concerned with attempts to cure the sick, the public has been taught the concept of health as not only an attainable but a maintainable commodity. The people are demanding more of their private physicians than the latter are either trained or particularly eager to dispense. Organized medicine has a very different public to handle from that which it had even a generation ago. Writers of popular books on medical subjects have descended like locusts on the land. Some of these are good; some are harmful. The busy doctor has no time to read them. His patients have, and are often critical and even suspicious if he is not as familiar with them as he is with the writings of Osler.

A second responsibility of organized medicine in medical care has to do with its own economics. The practising physician, both in general and in specialized practice, is a highly essential factor in human welfare. He must survive and serve, no matter how far preventive medicine may be perfected in the future. Accidents will happen, babies will be born, men will die, as they always have. On the other hand, the costs to the practitioner of maintaining himself, his family, and his work are increasing yearly, almost daily. The amount of preparation required grows; expensive mechanical equipment becomes indispensable in both diagnosis and treatment. With the improvement in preventive measures and the conquest of one epidemic disease after another, the actual care of the sick is relatively reduced. The discovery of new diseases to treat does not keep

pace with this reduction. Certain areas are definitely over-supplied with practitioners; other regions are undermanned. Survival is becoming a matter of distribution.

In facing this difficulty physicians themselves have tried many experiments along the general line of group practice. At these reasonable efforts, organized medicine has shown a tendency to look askance. The most outstanding instance is the recent experience in Washington, D. C., where organized medicine came very near falling into the toils of the Sherman Anti-trust Law. It escaped, but the principle seems to have been established that the local medical society, a fraction of the A.M.A. cannot prohibit other societies from practice when they are "organized legally and with rules relating to membership or behavior of members that are not found to be illegal." This principle holds even though such societies do not meet the approval of the local medical society.*

While its members are being driven for economic reasons to accept salaried positions, often in state pay, organized medicine still clings to its age-old belief in what it refers to as the freedom of the medical practitioner.

Three questions arise: Is this freedom as actual as it appears? Is it worth the uncertainties and financial difficulties faced by organized medicine? Is it worth the constant and irritating charge, supported by far too sound argument for complete refutation, that the people of this country are receiving inadequate medical care under the existing system?

The answer to the first is that, of course, the freedom of the medical practitioner is not what he thinks. In the first place he is already hemmed in by laws and restrictions limiting his practice in many ways. Second, he must rely on publicly supported hospitals, outside his control, for the care of many of his patients. Third, he is sadly limited in what he can now do by way of treatment because of the restricted financial condition of his patients themselves. The scientific practice of medicine is one thing; the possibility of its actual application quite another.

The answers to the other two questions, that of the doctor's living, and the inadequacy of medical care, I believe need not detain us. Dr. Hugh Cabot's book *The Doctor's Bill*, discusses the former, and even the somewhat sketchy "research" of the A.M.A. shows room for improvement in the country's medical care as it actually exists.

In attempting thus to outline the swiftly changing conditions that surround organized medicine and medical practice today, I have been somewhat unjust to the medical profession and to organized medicine itself. We must never forget that the very conditions that have altered and complicated the physician's problems are largely the product of his own unselfish and expert work in the fields of medical research and the application of new scientific discoveries. Already, for example, he has entered deep into the field of preventive medicine in a number of the specialties.

Within the ranks of organized medicine certain prophets arose back in the 'eighties and 'nineties with a vision decades ahead of their time. I refer to such men as Emmett Holt, Thomas Roach, and John Morse, in the field of pediatrics, who decided that it was wiser to feed babies properly from the start than to be called upon *in extremis* to watch them die in the convulsions of toxic enteritis. The pediatricians soon learned, and have pointed the way to the medical profession ever since, that the supervision of the healthy was the

* *New England J. Med.*, May 30, 1940, p. 940.

soundest form of productive medical practice.

In May, in Washington, before the Pan-American Scientific Congress, I heard Dr. Paul D. White, of Boston, read a paper on modern concepts of heart disease. Up to a generation ago our efforts went chiefly toward treatment of the recognized heart condition, very little to any study of the causes of the disease, practically none toward efforts to prevent these causes. The reversal of this traditional attitude during the past fifty years has transformed the cardiologist from the plodding slave of digitalis to a leader in the field of preventive medicine.

In my early days of practice, we orthopedic surgeons gloried in the osteoclast after bones had been allowed to become deformed. Now we are internists preventing deformity with cod liver oil and sunshine, and applying only an occasional brace.

These are but random samples of organized medicine's rapidly changing point of view. With its sera and vaccines and various immunological resources, it has entered the field of preventive medicine and public health. I cite these instances to indicate that we are not reactionary traditionalists at heart, only a bit slow on the pick-up. I cite them further to give point to the following opinion which I believe has weight at the present moment.

The time is over-ripe to discard our outworn terminology, to stop talking about curative and preventive medicine, to use instead the designation "medical care," whether that care is furnished to the absolutely healthy, the mildly indisposed, the acutely ill, or the chronic invalid. The term "public health" should be broadened to mean no longer a specialty in medicine, but to be taken in its literal sense as describing the health status of a community at any given moment and its averages through the years.

As already stated, the pediatricians learned this long ago. I wonder how many of them could continue in practice if they saw none but sick babies. The cardiologist derives the satisfactions of practice from learning ways to keep normal hearts normal. Endocrinologists are engaged in promoting health through refinement in the delicate adjustment of glandular activities which represent imbalance rather than disease. Psychiatric interest centers in mental health. Phthisiologists take thousands of pictures of normal chests rather than await the onset of pulmonary hemorrhage.

Organized medicine complains that the public health service is invading its sacred field of treatment and complains vaguely of "state medicine." It forgets that already it has itself invaded far deeper the field of preventive medicine and that its onslaught has but just begun. Organized medicine will do well to realize that of the diseases which still occur many are preventable and sometimes due to medicine's own ineptitude. Organized medicine should fix its eyes more fervently on the vision of its great idealists: first, the promotion of health; and second, treatment of disease. This is its great responsibility in medical care and it can be achieved best by obliterating the divisive names, preventive and curative, and bestowing the single title, medical care, to both.

What is organized medicine's first step toward this objective? The most effective place to begin is in the undergraduate medical school. A start has already been made, a striking one in New York, for example, where a district medical center has been provided by the public health service adjoining each of the five medical schools, in which thorough training of the undergraduate may be carried out in preventive medical theory and practice. Some other famous schools have already

taken this step. All will follow shortly.

The most effective work will be with the young physicians still in schools. Much, however, can be accomplished by extending to older practitioners the growing resources and opportunities for training in preventive medicine.

A second step is the more generous recognition of the merits, from the patient's point of view, of group practice in its various phases. For the most part, modest salaries in group practice are the rule. But the satisfactions of practice are not all financial. The rendering of service to their fellow men is the first principle of the physician's code. Group practice offers this reward in abundance.

In the abuse of free treatment clinics by patients having the capacity to pay, the doctors have an obvious grievance. On the other hand, in the case for example, where a public health treatment clinic is definitely for the protection of the public at large, as in the case of venereal disease, the physician must remember once again that he is a citizen first, and resolve this controversy in a spirit of equity and fair play for the public weal.

Already organized medicine has approved the insurance principle in the matter of hospitalization of the poor and moderately well-to-do. The time has come when this is in fact no longer controversial if the hospitals are to survive.

Voluntary health insurance has appeared upon the social scene in protean forms. This is a tide which organized medicine could not stem even though it so desired. The misfortune is that sound insurance principles are not more closely observed and that so many attempts are doubtless destined to fail before at last a satisfactory plan develops.

Toward compulsory health insurance organized medicine's attitude remains implacable. I will own to a rather strong doubt in my own mind as to the wisdom of suggestions thus far offered. It seems to me that there is an inherent evil in any compulsory scheme that includes only certain classes of those economically entitled to the service. It seems to me that a federal plan of compulsion in a country of so divergent characteristics as our own is beyond human power to administer. Regional or state-wide schemes on a trial basis would appear to be more logical. This is only one man's opinion and I still believe that experiment should continue, and only hesitate at going off the deep end instead of approaching the problem through shallower water.

Organized medicine's responsibility in medical care would be easier to define if all federal bureaus dealing with the nation's health were brought under a single department, such as a Ministry of Health. The A.M.A. would achieve a clearer definition of its advisory position in the fields of research, demonstration, and medical economics. Broadly speaking, it could occupy a relationship toward a federal department of health which the American Public Health Association occupies toward the U. S. Public Health Service. The tranquility which reigns in the latter relationship should be easy to develop in the former. Government endorsement of advice based on A.M.A. research would add to its weight and value.

In conclusion, organized medicine has travelled a long road toward assuming its responsibilities for medical care since it yielded, a bit unbecomingly, to its first irritation at the sensational revelations of the study entitled "The Costs of Medical Care." Much of the sound and fury has subsided. Organized medicine has emerged from the controversy not so badly off. Little by little the early attitudes of the House of Delegates have softened until now the platforms of the two schools of thought find daily less to keep them apart.

The health of the people is the first duty of government. The skill through which alone that health may be assured is in the hands of the trained members of organized medicine. Any act on the part of government which limits or thwarts that skill is not in the service of the people. Recognition of a common aim must be the guiding principle for a complete reconciliation between the two agencies. A first step in such reconciliation will be taken when both realize that medical care includes both curative and preventive medicine and that the two, if not identical, are at least homologous twins.

Typing of Typhoid Bacilli in the Western States by Means of Bacteriophage*

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THE method of typing various strains of *Eberthella typhosa*, as suggested by Craigie and Yen in 1938,[1] has to date received neither the recognition nor the widespread application that its useful possibilities seem to justify. The survey reported here was undertaken in an effort to bring the advantages of this method to the attention of those most likely to benefit by its use.

The typing method is based on certain peculiarities of a strain of bacteriophage, which is not only specific for the Vi form of the typhoid bacillus but also exhibits a selective affinity for the particular strain of *Eberthella typhosa* on which it is propagated and for epidemiologically related strains. This bacteriophage, which is termed Type II Vi phage, shows no action on the W form of *Eberthella typhosa*, nor does it affect any of the other pathological or normal inhabitants of the intestinal tract of man. By selective propagation of this bacteriophage on various strains of *Eberthella typhosa*, Craigie and Yen[1] have shown that it is possible to divide freshly isolated cultures into a limited number of readily distinguished types, which have been designated by the letter system A to J inclusive with the exception of I. Later reports by Craigie[2, 3] and by Yen[4] have subdivided types B, D, E, and F, and additional studies have reported new types designated as types L and M,[5] which are, however, rarely encountered.

METHOD

The method for typing cultures of *Eberthella typhosa* has been described in detail by Craigie and Yen,[1] and space does not permit a full description of the procedure. In brief, the method consists in applying a standard volume of a young broth culture of *Eberthella typhosa* to given areas of a nutrient agar plate and allowing the broth to dry. In the center of each of these areas is then deposited a standard volume of the typing phages. The plate is allowed to dry and is then inverted and incubated at 37.5° C. for approximately 2 hours. After storage overnight at a temperature of 4° C., the plates are again incubated at 37.5° C. for 3 to 5 hours and the results are then read. Type A cultures are lysed by all the phage preparations, while all other types show confluent lysis only with the homologous phages. Occasionally nonspecific plaques are pro-

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TABLE 1

Distribution of Cultures by States

	Type												
	A	B_1	B_2	*C*	D_1	E_1	F_1	*J*	*L*	*M*	*Imp. V*	*W*	*Totals*
California	15	1	4	7	—	22	40	2	1	1	13	2	108
Colorado	—	3	1	2	—	4	1	—	—	—	1	—	12
Idaho	—	—	—	1	—	—	1	—	—	—	—	—	2
Montana	—	1	4	—	—	2	—	—	—	—	—	4	11
Nevada	—	—	—	1	—	—	—	—	—	—	—	—	1
New Mexico	5	6	24	2	7	32	16	—	—	—	12	1	105
Oregon	24	1	4	7	5	14	10	4	—	—	6	1	76
Utah	1	—	2	10	1	—	—	—	—	—	—	2	16
Washington	7	1	1	—	2	7	—	1	—	—	—	9	28
Totals	52	13	40	30	15	81	68	7	1	1	32	19	359

duced, but there is little possibility of confusing these with the confluent lysis produced by the specific phages in the test dilutions. The technic of the tests, as described in the original publication[1] has been followed in all its essential details in the survey herein reported.

It must be emphasized that cultures can be typed only when in the Vi form, which means that the percentage of successful typings depends on the handling of the cultures prior to submission for typing. Freshly isolated cultures which have not undergone prolonged incubation or numerous transfers should yield a very high percentage of successful typings.

In addition to the Vi and W forms, Craigie and Yen have described the so-called imperfect V form, which is a typical Vi form in every respect except sensitivity to the type II phage preparations. These forms cannot be typed at present, but newer procedures may make it possible to classify these strains in the near future.[5]

RESULTS

This preliminary study, with material obtained through the courtesy of the many coöperating laboratories, has not only demonstrated many of the uses of the typing method, but has also given some indication of the distribution of the various types throughout the West. Table 1 shows the distribution of 359 cultures studied in the period from November 1, 1939, to June 1, 1940. It will be noted that types B_3, B_4, D_2, D_3, E_2, F_2, G, and H have not as yet been encountered in the area being studied. The figures in Table 1 also demonstrate that 97.1 per cent of all the typed cul-

TABLE 2

Distribution of Individuals by States

	Type													*Per cent Typed*
	A	B_1	B_2	*C*	D_1	E_1	F_1	*J*	*L*	*M*	*Imp. V*	*W*	*Total*	
California	12	1	4	6	—	16	37	2	1	1	7	2	89	90
Colorado	—	3	1	1	—	4	1	—	—	—	1	—	11	91
Idaho	—	—	—	1	—	—	1	—	—	—	—	—	2	100
Montana	—	1	3	—	—	1	—	—	—	—	—	2	7	71
Nevada	—	—	—	1	—	—	—	—	—	—	—	—	1	100
New Mexico	5	5	17	2	5	23	11	—	—	—	3	1	72	94
Oregon	16	1	3	6	3	9	8	3	—	—	5	1	55	89
Utah	1	—	1	10	1	—	—	—	—	—	—	2	15	87
Washington	7	1	1	—	2	7	—	1	—	—	—	9	28	68
Totals	41	12	30	27	11	60	58	6	1	1	16	17	280	88.2

TABLE 3

Number of Isolations per Individual

Number of Times Isolated Per Individual	Type												
	A	B_1	B_2	*C*	D_1	E_1	F_1	*J*	*L*	*M*	*Imp. V*	*W*	*Totals*
1	34	11	23	24	8	48	51	5	1	1	11	15	232
2	6	1	6	3	2	6	4	1	—	—	1	2	32
3	—	—	—	—	1	4	3	—	—	—	3	—	11
4	—	—	—	—	—	1	—	—	—	—	—	—	1
5	—	—	1	—	—	1	—	—	—	—	—	—	2
6	1	—	—	—	—	—	—	—	—	—	—	—	1
10	—	—	—	—	—	—	—	—	—	—	1	—	1
Number of Individuals	41	12	30	27	11	60	58	6	1	1	16	17	280
Number of Cultures	52	13	40	30	15	81	68	7	1	1	32	19	359

tures fall into the 6 main groups A, B, C, D, E, and F.

Since in many cases more than one culture was received from the same individual, Table 2 is included to show the distribution of the individual patients by states. It will be noted that 88.2 per cent of all those patients studied have been successfully typed, while the remainder of those investigated were represented by W or imperfect V form cultures. The percentage of successful typings should increase as the need for submitting freshly isolated cultures becomes more generally recognized. The cultures submitted for typing in the present study ranged up to 12 years in age and it is felt that, under these conditions, a successful report in 88.2 per cent of all individuals is decidedly encouraging.

Table 3 shows the number of isolations per individual for the 280 patients studied in this survey. It is to be emphasized that no exceptions to the type stability as originally reported by Craigie and Yen[1] have been encountered. This stability of type in the individual has been further confirmed in laboratory studies now in progress, using white mice. The only known example of change in type is the single case reported by Helmer and her collaborators,[6] but it must be noted that this change was one in subtype only. Since the significance of the subtypes is not yet certain, this single case does not destroy the usefulness of the typing method.

Table 4 shows the origin of the 359 cultures studied in this preliminary survey. Table 5 represents in condensed form the results of this investigation.

TABLE 4

Origin of Cultures and Status of Individuals

	Sources	*Number of Cultures*	*Total*
Cases	Blood	84	261
	Urine	9	
	Feces	143	
	Unknown	25	
Carriers	Feces	37	43
	Unknown	6	
Unknown	Feces	31	48
	Urine	1	
	Unknown	16	
Pericardium at Autopsy			1
Gall Bladder after Removal			1
Chest Abscess			1
Rib Abscess			1
Abdominal Wound			1
River Water			1
Septic Tank Effluent			1
Total Cultures Studied			359

TABLE 5

Summary

Total Number of Cultures received	359
Number of Cultures typed	308
Total Number of Individuals represented	280
Number of Individuals represented by typed cultures	247 or 88.2%

DISCUSSION

Numerous possibilities regarding the application of the typhoid typing method are readily seen. Some of the

major facts regarding the uses of method are as follows:

1. All cases arising from a carrier will show the same type as the carrier and therefore the same type as each other.
2. The typing of all known carriers in a given area will permit the immediate elimination of some carriers from consideration and the investigation of the activities of others when typhoid cases occur in the same district.
3. In any outbreak, the typing will show the minimum number of sources involved. The typing will often allow the detection of two or more concurrent outbreaks and will also permit the separation of endemic and epidemic cases.
4. Typing of all cultures from a given outbreak will usually determine whether the epidemic is due to a carrier or to sewage contamination. If all cases show the same type, a carrier is probably responsible; if a variety of types is encountered, sewage contamination is probably responsible for the outbreak.[7]
5. Complete typing studies in a given outbreak will indicate definitely whether all sources of infection have been uncovered.

Additional applications and possibilities will undoubtedly occur to the minds of those interested in this method.

A brief discussion of some actual uses of the typhoid typing method may be of interest.

Example 1—An outbreak of typhoid fever in Los Angeles City and County in the fall of 1939 was investigated by typing and epidemiological studies. The typing results showed a great preponderance of a single type, accompanied by scattered cases of non-related types. On the basis of the laboratory investigations, which were carried out in Denver without any epidemiological information, it was possible to predict that the outbreak was due to a carrier discharging type F_1 organisms and it was also possible to separate most of the sporadic endemic cases from the main outbreak. Epidemiological studies were in almost complete agreement with laboratory reports. When the carrier was located he was discharging the same type organisms as had been predicted. To the best of our knowledge, this was the first concurrent application of epidemiological and typing studies in a typhoid fever outbreak in the United States. The outbreak is reported in detail elsewhere.[8]

Example 2—Type J cultures were received within a short time from the southern part of Washington and the northern part of Oregon. Due to the rarity with which this type was encountered and the almost simultaneous arrival of the cultures, the matter was investigated more closely. It was found that the Washington culture was from a carrier and the Oregon culture was from a clinical case, the grandson of the carrier, who had visited his grandfather within a possible incubation period before symptoms appeared. This example points out the value of a centralized typing laboratory in correlating reports between states.

Example 3—A carrier in New Mexico had no known contacts with clinical cases in her vicinity. However, most of the typhoid cases in the vicinity showed the same type of organism as the carrier. Such evidence, while not conclusive, indicates the possibility of infection chains as yet undisclosed.

Example 4—A septic tank in Utah showed typhoid bacilli in the effluent. A follow-up showed several carriers of the same type of *Eberthella typhosa* in the family using the tank. An affidavit as to the typing results was of legal aid.

Example 5—A known carrier in Washington State sold cream to a creamery, where it was pasteurized and made into butter. No cases have been reported among users of the butter. A family using separated milk sold directly by the carrier showed a case of typhoid. Another case appeared in a family who ate a meal with the family of the carrier. Both these clinical cases showed the same typing results as the carrier.

Example 6—A Washington carrier,

with a history of typhoid fever 40 years previously, sold milk to a confectionery. Clinical cases which developed in two purchasers of the milk showed the same type organism as the carrier.

Example 7—A practical nurse in Colorado cared for a suspected typhoid carrier. The nurse and two members of her family subsequently developed typhoid fever. All the cases showed the same type organism.

Example 8—A Montana culture obtained from a clinical case in a small town was followed 1 week later by a culture from the brother of the first patient. The two patients showed different types, and with our present knowledge of the typing method, it was possible to report that one carrier could not have infected both patients, nor could the second patient have been infected by his sister. The chances of two different carriers infecting two members of the same family at approximately the same time seemed rather remote, and it was therefore suggested that the water supply be investigated, since a heavily polluted water could give rise to different types in different users of the water. Investigation showed a history of having drunk raw creek water in the town.

The above examples not only furnish additional evidence regarding the stability of types but also point out some of the ways in which the typing method may aid in establishing the source of infection in a given case, which is a matter of primary importance to the health officer, epidemiologist, and the sanitarian. At the present time, it is not practical for the laboratories concerned to do their own typing, largely because of the lack of trained personnel. However, the method is easily learned and it is hoped that it will eventually be applied as routine procedure. Another alternative is the establishment and support of a centralized bureau for the typing and control of all known carriers, with financial aid supplied by the states interested or by the federal government. At present, the author will type and report promptly on all typhoid strains submitted. Data indicating the source of the culture and the status of the patient would be helpful in future summaries of results.

SUMMARY

The typhoid typing method of Craigie and Yen is proving a valuable and sensitive tool in the control of typhoid fever. Properly applied, the method can be a useful adjunct to epidemiological studies.

In a study of 359 cultures obtained in 9 western states, the typing method has yielded valuable information in numerous cases. The procedure, when applied routinely, is expected to do much to reduce the incidence of a once serious disease.

Pending the establishment of a permanent agency for the control of carriers, the author is prepared to assist in the laboratory study of freshly isolated strains and will report as promptly as possible on the results of the typing procedure. The future progress of this work is obviously dependent on the aid and coöperation of all concerned.

ACKNOWLEDGMENT—The author wishes to express his thanks to Dr. James Craigie of the University of Toronto for the original supply of type cultures and homologous bacteriophage preparations and for numerous helpful suggestions. Gratitude must be expressed to Dr. Karl F. Meyer of the University of California and to Dr. Fred T. Foard of the U. S. Public Health Service for their invaluable aid in establishing sources of material. The directors and technicians of the state, county, and city laboratories which supplied material for this survey are responsible for having made this work possible and their aid is gratefully acknowledged.

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Rapid Methods for the Estimation of Air Dustiness*

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THE classification of dust methods as rapid or not rapid is difficult, and depends on the interpretation of the word "rapid." Several methods for estimating air dustiness could qualify as rapid, but they are limited in scope and are not applicable for certain purposes; therefore, other methods in common use that are required for certain applications are included in the discussion.

Owing to the large amount of material that has been published on the various technics for the estimation of dust concentrations, no attempt will be made to describe in detail the "cook book" part of the procedures, but rather the more general aspects will be considered.

PROPERTIES AND CHARACTERISTICS OF AEROSOLS

Dust suspended in air is a colloidal system in which air is the dispersion medium and dust (suspensoid or dispersoid) the dispersed phase. Such a system is called an "aerosol" which is analogous to the term "hydrosol" used to designate dispersed systems in water. As the dispersion medium (air) remains fairly constant in composition, consideration will be given primarily to the dispersoid, that is, dust.

Dust is formed by disintegration of solid material by such processes as grinding, crushing, drilling, and shattering. The qualitative composition of the air-borne dust formed from complex substances is largely the same as that of the parent substance, but soon after being released into the air the quantitative composition may differ owing to differential disintegration and selective settling. An aerosol, therefore, may be made up of particles varying widely in size and composition. The particles may not be distributed uniformly in the air and are in a changing state owing to settling, flocculation, and air currents. The chemical, physical, electrical, and optical properties of the particles add to the complexity.

These considerations indicate the extreme difficulty of developing a method that will give absolute values for the number of particles in the air. The methods available give only an empirical value or index of air dustiness. Because of the empirical nature of the methods it is not to be expected that the results obtained by different methods will agree closely unless the technic is essentially the same.

PURPOSE OF MAKING ESTIMATIONS OF AIR DUSTINESS

Estimations of air dustiness are made for various reasons, such as determina-

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TABLE 1

Methods of Estimating Air Dustiness

Method	Method: Collection	Method: Estimation: Direct	Method: Estimation: Indirect	Reference
		Dust Not Collected from Air		
Tyndallometer	—		Photometry	Berek, M., Männchen, K., and Schäfer, W., Über tyndallometrische Messung des Staubgehaltes der Luft und ein neues Staubmessgerät. *Ztschr. f. Instrumentenkunde*, 56: 49–56, 1936.
Dustoscope	—		Comparison	Service to Industry, Box 133, West Hartford, Conn., Dustoscope.
Dust camera	—	Counting	do.	Ficklen, J. B., and Ott, L. H., A Photographic Dust Counter for Industrial Health Purposes. *J. Indust. Hyg.*, 17:164–173, 1935.
		Dust Collected from Air		
Rapid samplers				
Konimeter	Impingement on coated slide	Counting		Littlefield, J. B., Brown, C. E., and Schrenk, H. H., Technique for Routine Use of the Konimeter. Bureau of Mines, *Information Circular 6993*, 1938, 6 pp.
			Photometry	Walton, W. H., The Estimation of Konimeter Dust Spots. *J. Indust. Hyg. & Toxicol.*, 18:689–698, 1936.
Hill	do.	do.		The Surty Manufacturing Co., Inc., 4139 W. Kinzie St., Chicago, Ill., Dust Danger and Dust Counts: *Catalog No. 12.*
Owens Jet	Condensation and impingement	Counting		Owens, J. S., Jet Dust Counting Apparatus. *J. Indust. Hyg.*, 4:522–534, 1923.
Owens-Hatch	do.		Comparison	Hatch, T., and Thompson, E. W., A Rapid Method of Dust Sampling and Approximate Quantitation for Routine Plant Operation. *J. Indust. Hyg.*, 16:92–99, 1934.
Bausch & Lomb	do.	Counting		Gurney, S. W., Williams, C. R., and Meigs, R. R., Investigation of the Characteristics of the Bausch & Lomb Dust Counter. *J. Indust. Hyg. & Toxicol.*, 20:24–35, 1938.

tion of source of dust, study of air pollution, and effectiveness of dust control measures, estimation of the health hazard, and establishment of permissible limits. The choice of a method may, and in many instances does, depend on the purpose for which the estimations are being made. If results are desired for control or for determining the source of dusts, almost any method can be used. If, however, one wishes results that will be comparable with those obtained previously, then the same method must be used, because results obtained by different methods are not necessarily comparable. In estimating the health hazard on the basis of permissible concentrations, it is particularly important to use the method by which the permissible concentrations were established. This is the main reason for the general use of the impinger in this country, regardless of its advantages and disadvantages.

ESTIMATION OF AIR DUSTINESS

Table 1 lists rapid and other well known methods for the estimation of air

TABLE 1 (Cont.)

Methods of Estimating Air Dustiness

Method	Collection	Estimation: Direct	Estimation: Indirect	Reference
		Dust Collected from Air		
Slow samplers				
Impinger	Impingement and washing	Counting		Brown, C. E., and Schrenk, H. H., A Technique for Use of the Impinger Method. Bureau of Mines, *Information Circular 7026*, 1938, 20. pp.
			Photometry	Photometric Dust Determinations. *Iron Age*, 141:46 (July 6), 1939.
Electric precipitator	Electric precipitation	Weighing Counting Chemical analysis	Photometry	Barnes, E. C., and Penney, G. W., An Electrostatic Dust Weight Sampler. *J. Indust. Hyg. & Toxicol.*, 20:259–265 (Mar.), 1938.
Thermal precipitator	Thermal precipitation	Counting		Patterson, H. S., Sampling of Mine Dusts with the Thermal Precipitator. *Inst. Min. and Met. Bull. 417*, June, 1939, 7 pp., 1 pl.
Soluble filters	Filtration	Counting Weighing Chemical analysis		Matthews, J. W., Holt, P. F., Sanderson, P. M., and Briscoe, H. V. A., Porous Solid Filters for Sampling Industrial Dusts. *J. Chem. Met. & Min. Soc.*, South Africa, 37:161–166 (Nov.), 1936.
Thimble	do.	Weighing Chemical analysis		Trostel, L. J., and Frevert, H. W., Collection and Examination of Explosive Dusts in Air. *J. Indust. Eng. Chem.*, 15:232–236 (Mar.), 1923.
Filter paper	do.	Weighing		Katz, S. H., and Smith, G. W., Determination of Suspended Matter in Gases by Collection on Filter Paper: Bureau of Mines, *Rep. Investigations 2378*, 1922, 6 pp.
			Comparison	Shaw, N., and Owens, J. S., *The Smoke Problem of Great Cities*. Constable & Co., Ltd., 10 and 12 Orange St., Leicester Square WC 2, London, 1925, 301 pp., ch. VII.

dustiness, but no attempt has been made to include all procedures. The methods have been divided into two groups: (1) Those in which estimations are made without collecting the dust from the air, and (2) those in which the dust is collected from the air before it is estimated. The collection methods are subdivided into two groups on the basis of sampling rate, that is, there are rapid samplers and slow samplers. Methods of estimating the dust are divided into direct and indirect procedures.

METHODS IN WHICH DUST IS NOT COLLECTED

Probably the simplest method of estimating dust concentrations is direct observation. This method, of course, is limited, mainly because of inability of the human eye to see concentrations of dust that are of hygienic significance unless the particles are magnified.

Methods based on the Tyndall effect and those in which readings can be obtained on the concentration of dust as it exists in the air have interesting possibilities. No changes are produced in the dust such as may occur when dust is collected. It is easy to demonstrate the presence of dust in the air. Readings can be made rapidly and continuously, thereby showing variations in concentrations. On the other hand,

there are both theoretical and practical reasons why these instruments have not been widely used. If the amount of reflected light is measured, variations are caused by size and color of particles; fogs and mist affect results, and it is difficult to measure low concentrations. If the amount of dust is estimated by direct visual observations of reflected light the results obtained can be only approximate. If the particles are photographed, the apparatus, accessories, and technic tend to be complicated.

METHODS IN WHICH DUST IS COLLECTED

As already stated, methods for the estimation of air dustiness that require collection of the dust from the air for quantitative determination are divided into two groups on the basis of sampling time.

The rapid samplers are usually small and compact; little time is required for sampling; numerous samples may be taken; and the samples may be quantitated without special preparation. They are particularly useful for preliminary surveys, for control operations, and for following a cycle of operations when conditions are changing rapidly. Dust is collected from only a small volume of air and several samples are required for a fair average.

The slow samplers collect the dust over a period of time and give samples that are more representative of average conditions. The amount of dust collected is greater and offers better opportunities for several methods of quantitation and for making other examinations such as determination of composition. The devices usually are bulky, and power requirements may be large.

COLLECTION OF SAMPLE

In choosing a method for collecting dust samples it is necessary to consider the complexity of the aerosol, efficiency of collection, effect of collection on dust, and determination of quantity. For example, oil droplets interfere in counting samples collected by impingement on slides. Whether or not a method has poor, good, or excellent collecting efficiency should be known, as well as any special characteristics such as selective efficiency. The effect of collection on the dust, as solubility and shattering should not be overlooked. The method of collection is important from the standpoint of quantitation because the dust may be so affected that some methods of quantitation may be impractical or impossible. If count only is desired a very small sample may be sufficient; if weight and composition are desired, larger samples must be collected. Cryolite has a refractive index almost the same as that of water; therefore it would be difficult to count the dust particles if this liquid were used for collection. Dust that is soluble in impinger liquids cannot be collected by this method for counting. In other words, the choice of collecting procedure may depend not only on the properties of dispersoids in the air but also on subsequent treatment of the sample.

Table 1 lists the following methods for collecting dust: Impingement on a coated slide, condensation and impingement on a clean slide, impingement and washing, electric precipitation, thermal precipitation, and filtration.

Impingement on coated slide—Devices that collect dust by impingement on a coated slide apparently have a fairly high collecting efficiency. Mist, oil droplets, and smoke may make counting difficult. Particles tend to "pile up," and the upper limit of dust concentrations that can be estimated may be as low as approximately 50 million particles per cu. ft. Difficulty has been found in obtaining a suitable adhesive and in applying a film to the slide.

Condensation of moisture and impingement—Devices that collect dust by condensation of moisture and im-

pingement apparently have a fairly high collecting efficiency, although they are somewhat selective for particles of different sizes. Mist, oil droplets, and smoke may make counting difficult or give unusually high counts if dark-field illumination is used.

Impingement and washing—Collection by impingement and washing, the principle on which the well known impinger apparatus is based, is a highly efficient method, especially for dusts that have hygienic significance. The sample collected may be counted, weighed, and determined chemically or photometrically.

In collecting a sample by the impinger for counting, consideration must be given to such factors as refractive index (cryolite), solubility (potassium chloride), specific gravity (wood dust will float), and flocculation (asbestos in water). Shattering of dust particles by the impinger has been reported recently in several articles. Owing to its interest data collected on this subject during other studies are presented.

Table 2 gives the results of counts by light- and dark-field technics of samples collected simultaneously by the large impinger and by an electric precipitator. Counts by the light-field technic were in good agreement. Counts by the dark-field technic were slightly lower for the impinger, indicating the possibility that the impinger did not stop some of the smaller particles that were stopped by the electric precipitator. Unless one assumes that shattering is caused to the same extent by the electric precipitator, or that by some fortuitous circumstances the increase in count caused by shattering just balanced a lack of efficiency on the part of the impinger, apparently there is no significant shattering of silica dust. Other dusts may behave differently. These results are presented for their general interest, and it is not to be inferred that they completely answer the question of shattering by the impinger. They also indicate that the electric precipitator may be used for the collection of silica-dust samples to be quantitated by the impinger counting technic. Before this procedure is used for other dusts comparative estimations should be made with both the impinger and electric precipitator.

TABLE 2

Concentration of Silica Dust (SiO_2), Millions of Particles per Cubic Foot, in Electric Precipitator and Impinger Samples

Light Field		*Ratio, Impinger to Electric Precipitator*	*Dark Field*		*Ratio, Impinger to Electric Precipitator*
Electric Precipitator	*Impinger*		*Electric Precipitator*	*Impinger*	
51	45	0.88	442	375	0.85
55	40	0.73	420	375	0.89
55	40	0.73	442	468	1.06
257	287	1.12	1,990	1,090	0.55
283	375	1.32	1,550	2,030	1.32
290	280	0.97	1,960	1,610	0.82
354	450	1.27	1,880	1,250	0.67
381	388	1.02	2,430	1,870	0.77
381	438	1.15	2,100	2,190	1.04
398	475	1.19	2,320	2,660	1.15
407	387	0.95	2,880	2,180	0.76
		1.03 *			0.90 *

* Average

Electric precipitation—Electric precipitation probably is the most efficient method for the collection of dusts. Samples may be collected on metal or glass tubes or on metal or plastic foil.

Thermal precipitation—Thermal precipitation, which is based on the

phenomena that dispersoids are repelled from a warm area and deposited on a cool surface, recently has been used widely in England. It is a highly efficient method. The sampling rate is very slow—a few milliliters per minute. The samples are collected on glass cover slips.

Filtration — Filtration methods collect the dust in or on filter media such as paper thimbles, filter paper, and soluble filters that have high collecting efficiency. Samples collected with paper thimbles or filter paper can be determined quantitatively by weighing or by comparison on basis of color. Change in resistance also has been used as a criterion of the amount of dust collected. Dust collected with soluble filters may be counted, weighed, and determined chemically or photometrically. This method ordinarily is used in collecting fairly large samples to determine the composition of the dust.

ESTIMATION

As stated previously, methods of estimation have been divided into direct (weighing, chemical analysis, and counting) and indirect (in which readings are compared photometrically or with a standard, such as the automatic Owens method).

DIRECT METHODS

Weighing—Weighing is one of the simplest ways of estimating collected dust. The main objection to this method for pneumoconiosis producing dusts, where surface area of the particles is a prime consideration, is the fact that the results are unduly affected by a few large particles. Another objection is the difficulty of obtaining exact weight owing to the small size of the sample and complications of weighing procedure by condensation of moisture on the collection medium.

Chemical analysis—Chemical analysis is used widely for determination of all except pneumoconiosis producing dust, for which chemical methods are involved and not very satisfactory.

Counting—Counting is the most commonly used method of estimating pneumoconiosis producing dusts for hygienic purposes. It is generally agreed that only particles smaller than 10 microns are physiologically significant, and that most of the particles of air-borne dust usually are less than 3 μ. As the smallest particles that can be seen with the naked eye are approximately 100 μ, the microscope is necessary for counting the particles. Obviously the size of the smallest particles seen will vary with the optical system used. The size of the smallest visible particle depends on the objective and is not influenced significantly by the eyepiece or tube length. Standardization of technic is necessary to obtain good reproducibility.

INDIRECT METHODS

Photometric measurements — Differences in particle size and color cause variations in measurements of reflected and transmitted light; hence such measurements are limited primarily to dusts that are fairly uniform. Calibrations are necessary for each type of dust.

Comparison with standards — Comparison with standards affords a rapid means of making estimations. Although this method gives only approximations and its application has been limited, it offers interesting possibilities.

DISCUSSION

The choice of a method depends not so much on whether it is rapid or slow as on the circumstances relating to the estimations. In fact, virtually every survey introduces new factors that must be solved individually and that require common sense and ingenuity on the part of the operator.

The empirical nature of the results

might be taken as an encouragement for carelessness in carrying out estimations. Just the opposite should be true. Some changes in technic may have little or no significant effect, whereas other seemingly minor ones may affect the results materially. Established technics should be followed carefully, and innovations should not be introduced without careful study.

Considerable thought and care should be used in interpreting dust estimations. A thorough understanding of the industrial operations and limitations of the method is essential to an intelligent interpretation of the results. It is easy to consider the results as absolute and to read into them something that is not there. This point can be emphasized by citing an example of the reported shattering of dust by the impinger. On seeing one report an executive was extremely angry at the situation. His interpretation was that the impinger was making more particles than were present in the air, thus exaggerating conditions in his plant, and that he was being forced to do more dust control work than was necessary. He overlooked entirely the fact that the impinger had been used in establishing the permissible limits, therefore, that any shattering would have occurred also when the permissible limits were established. In other words, whether or not the impinger causes shattering has no significant effect on the practical value of the impinger.

SUMMARY

Various methods are given for the estimation of air dustiness. Principles and technic of collection and quantitative determination are discussed briefly. Interpretation of dust estimation should be based on an understanding of atmospheric conditions, work schedule, plant operation, physiological effects of dusts, and limitations of the method used.

DISCUSSION

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DR. SCHRENK, in his paper, discussed the properties of "aerosols," why estimations of air dustiness are required, and the various methods by which these estimations can be made

It was shown that a dust condition exists because an industrial process in operation is associated with the generation of quantities of dust. The dust concentrations present in the surrounding atmosphere are created by the type of, and variations in, the process, by selective settling, differential disintegration, and by factors outside the process itself that may have direct effects.

If occupational exposures are involved, the problem is potentially a "real hazard." The dustiness of the atmosphere is estimated for any or all of several reasons:

1. To evaluate or "index" the occupational dust exposures and the general air conditions of an industrial establishment.

2. By correlating these findings with medical studies on the same occupations; to establish a safe upper or permissible limit of dustiness.

3. To aid in the design, to determine the effectiveness, and to assist in the continued efficient operation of dust control equipment.

After making a thorough survey, the method and sampling instrument that

TABLE 1

Dust Counts Classified According to Type of Drilling Granite Quarries. No Dust Control

Dust Counts in Millions of Particles per Cubic Foot of Air (Light Field Technic)

Type of Operation	*Average Drilling*	*Maximum Drilling*	*Minimum Drilling*	*Weighted Year-round Average*
Leyner drilling	141	339	24	80
Jack-hammer	131	324	21	70
Plug drilling	69	217	10	50

are best adapted to the conditions of the problem are selected. Often practical considerations are the factors that decide the choice. We realize that no method of dust estimation yields results that are absolute. However, if the procedure demonstrates high efficiencies within the range of particle sizes that are of hygienic significance and results that can be duplicated, it can in effect be calibrated against medical findings.

A study,* completed recently, of the granite quarries in Vermont illustrates a typical industrial dust problem. The occupations involved exposure to dust produced by drilling with pneumatic or compressed-air driven tools. The work was variable and the dust concentrations were influenced directly by the type of drilling, location, weather conditions, and other operations in the vicinity.

In selecting a method for estimating the exposure of these occupations, the hazardous nature of the dust, the high varying concentrations present, and the fact that a permissable limit of dustiness was to be determined had to be considered. The procedure of dust estimation that adapted itself best to the requirements was the slow sampling method using a modified Greenburg-Smith impinger. Power for an electric precipitator was not available.

* The Granite Quarries of Vermont, 1939. Office of Industrial Hygiene, State Department of Health, Barre, Vt.

On the basis of medical information obtained from the same group a limit of 10 million dust particles per cubic foot was established and ventilating equipment to reduce the dust concentrations to below this level were experimented with and tested. A dust control apparatus of the local exhaust type was developed specifically for quarry drilling operations. By designing this machine for a total static pressure of less than 20 inches of water gauge, the cost of manufacture of such a low pressure system proved to be less than one-half the cost of a commercial high pressure or vacuum system for the same application. Repeated tests now showed the dust concentration in the working atmosphere to be consistently less than 5 million particles per cubic foot.

With the use of control apparatus the high dust concentrations were obviously reduced to a low level and their wide variations for the most part eliminated.

Rapid or grab sampling instruments for evaluating air dustiness find wide use in applications of this type. They are compact, easy to operate, and in low dust concentrations give a reliable index.

In general dust control work, where periodic routine inspections are necessary, they prove very effective for checking on the maintenance of dust control programs, particularly when used in conjunction with ventilation determinations.

Rapid Methods for the Determination of Gases in the Air*

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AIR analysis is a complex problem that does not lend itself readily to a complete standardization. The variations and combinations of gaseous contaminants are too extensive to permit of covering all the possibilities, and for that reason no rigid and fixed routine can be set for analytical procedures. For the determination of a particular contaminant or group of contaminants, however, various practical methods can be assimilated and tabulated. This has been well done by the Subcommittee on Chemical Methods in Air Analysis and reported in American Public Health Association *Year Books*.[1, 2] Similar work has been accomplished by the Air Hygiene Foundation.[3] The choice of a method or combination of methods must be left to the judgment of the analyst. Frequently no satisfactory method is recorded for a particular problem, in which case success is governed by the ingenuity of the investigator in devising a method based on known physical properties and chemical reactions.

In the selection of a method, consideration must be given to the particular problem at hand. If the situation involves only the control of contamination in an industrial plant it matters little whether the analytical method used yields results accurate within ± 5 per cent or 25 per cent. In some instances, results accurate to within 50 per cent are satisfactory for control work. Our physiological threshold limits in many instances are not sufficiently definitely established to require greater accuracy. Also we should strive for a considerable safety factor rather than be satisfied with an atmosphere contaminated to the highest point believed compatible with health.

On the other hand, however, if we plan to record our findings as a guide to others, we should thoroughly investigate analytical procedures and select only those yielding accurate and dependable results. In either case, the method should be tried out with synthetic atmospheres in the laboratory prepared to simulate those of which analyses are to be made. It is very essential that the investigator know from experience with prepared atmospheres just what the method will yield under his manipulation. Air analysis should not be entrusted to "cookbook" chemistry and the blind following of printed instructions with little regard for the dependability of results.

Some reports on the toxic action of gases ignore chemical data necessary to establish concentrations of air contaminants. The report that makes no mention of analytical methods or merely states "analyses were made by standard

* Read before the Industrial Hygiene Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 19, 1939.

methods" is not convincing, and unless dependable analytical data are presented, thinking men are not likely to be impressed by the results. Likewise the report showing the use of a method which has not been adequately tested injects cause for questioning. Too often so-called threshold limits are set up by some group without the necessary data and proof of analytical dependability. This only adds confusion.

METHODS OF DETECTION AND ESTIMATION

1. ODOR

The most universally available rapid method of detecting and estimating gaseous contamination is by odor, and it behooves the industrial hygienist to determine early in his career just what and how much he can recognize by the sense of smell. Individual sensitivity to odors varies considerably, and fatigue occurs rapidly, but the individual notation of the initial odor of known concentrations is an extremely valuable qualitative and quantitative guide in air analysis for gases and vapors. There is a need for more data on odor intensities.[4, 5, 6]

2. CHEMICAL METHODS

Samples may be measured and collected by aspiration through the test material or absorption media by means of water displacement, a calibrated rubber bulb, piston type hand pump, or through a flow meter by any suction device. Another very convenient method of sampling is the partly evacuated bottle of 1 to 20 liters. Evacuation is conveniently done in the field by use of the hand pump and measured on a dial type gauge. The sample may then be absorbed by agitation with suitable absorption media or a direct determination may be made in the bottle by addition of reagents.

Chemical methods that are rapid and relatively easy to manipulate usually depend upon a color reaction and are frequently adjusted to indicate concentrations by the appearance or disappearance of a color or turbidity during sampling. Some examples are the iodometric determination of hydrogen cyanide, hydrogen sulfide and sulfur dioxide by aspiration of a few liters of atmosphere through a scrubber containing potassium iodide-starch solution and a measured amount of 0.002 normal iodine in which disappearance of blue color marks completion of the test; the determination of chlorine by aspirating the atmosphere through a postassium iodide-starch solution containing a measured amount of 0.002 normal sodium thiosulfate in which appearance of a blue color marks the end point; the determination of ammonia by aspirating the air through water containing methyl red and a measured amount of 0.01 normal sulfuric acid until the color of the indicator changes; the determination of acid gases and vapors such as hydrochloric, hydrofluoric, hydrobromic, formic, and acetic by aspirating through 0.01 normal sodium hydroxide and an appropriate indicator such as methyl red. In the case of hydrofluoric acid the scrubber must be coated throughout with paraffin. Controls should always be made with uncontaminated air. These tests are method or adaptations based on methods used by the U. S. Bureau of Mines for testing gas masks.[7]

The phosgene test paper method employing paper dipped in an alcoholic solution of para-dimethylaminobenzaldehyde and diphenylamine may be added to this group. We have found, by means of synthetic atmospheres made in our laboratory, that the phosgene test paper method is more reliable and satisfactory than other published methods for the determination of phosgene in concentrations of ½ to 2 p.p.m. When the paper is suspended in the atmosphere, ½ p.p.m. phosgene pro-

duces a light lemon yellow color in 4–5 minutes and a dark yellow in 10–15 minutes. Higher concentrations produce proportionately greater color changes up to a dark orange shade which occurs in about 8 minutes with 2 p.p.m., and 15 minutes with 1 p.p.m. The effects of temperature, humidity, and air motion were not studied. Chlorine and hydrochloric acid give similar reactions. Incidentally, it was noted that to the average individual 1 p.p.m. phosgene is easily noticeable by odor and ½ p.p.m. is detectable by a faint characteristic odor; the same odor evident whenever a chlorinated hydrocarbon comes in contact with a flame. In neither case is there a distinct irritation of eyes, nose, or throat. For higher concentrations of phosgene, the atmosphere is aspirated through saturated aniline water.[8] Evaluation can be made by comparison of turbidity with standards or by weighing the precipitated diphenyl urea.

Other rapid chemical tests employing a similar technic and using a piston type hand pump to aspirate the sample are the lead acetate test paper method for hydrogen sulfide, the benzidine-copper acetate and congo red-silver nitrate test paper methods for hydrogen cyanide, the potassium iodide-iodate test paper for sulfur dioxide and the sulphanilic acid-alpha naphthalamine test solution method for nitrogen oxides all of which are recommended by the Department of Industrial Research, London.[9] These methods have been arranged for rapid field tests, and concentrations are computed from the number of piston strokes necessary to match a certain definite color on the test paper or solution.

Ozone in the air may be satisfactorily determined[10] in the absence of interfering gases by drawing the air sample through alkaline potassium iodide-starch solution, acidifying with sulfuric acid and discharging the color with a measured amount of standard sodium thiosulfate solution.

Arsine can be detected by passing the contaminated air over lead acetate solution to remove sulfides, then over test papers[11] dipped in 5 per cent mercuric chloride. It is probable that this method will prove satisfactory for rapid semi-quantitative work when standards have been prepared. The method is said to produce a distinct yellow color in concentrations of 10 p.p.m.[12] Arsine, stibine, and phosphine also color silver nitrate paper. Arsine[13] produces with silver nitrate a yellow color changing to black, while stibine and phosphine both produce black. The limit of sensitivity of these color reactions is of the order of 1 p.p.m.

Formaldehyde may be determined by collection in water, employing three scrubbers in series or better, a partly evacuated bottle, adding Schiff's-Elvove reagent and comparing the resultant color with that of formaldehyde standards.[14]

Carbon dioxide in the absence of other volatile acids or bases may be determined continuously by aspiration of the atmosphere through a standard sodium bicarbonate solution containing an indicator such as phenolsulphonthalein. The color changes are compared to standards and are independent of the volume of air aspirated.[15] This same method can be applied to the determination of certain combustible gases containing carbon atoms. In this instance, carbon dioxide must first be removed from the atmosphere and then the combustibles completely oxidized by suitable means such as a hot wire spiral, after which the resultant carbon dioxide is determined. The determination can be continuously registered by photoelectric means if desired.[16]

Carbon dioxide, oxygen, nitrogen, carbon monoxide, and hydrocarbons may be readily and quickly determined by means of the portable water Orsat[17]

with an accuracy of approximately 0.2 per cent by volume.

A practical improvised method for the determination of carbon dioxide and oxygen by means of a hypodermic syringe has been described by Henderson.[18]

Concentrations of oxygen below 16 per cent can readily be detected by the flame safety lamp[19] or in the assured absence of combustibles, by means of a lighted candle, which ordinarily extinguishes in less than 16.5 per cent oxygen.

The M.S.A.[20] hydrogen sulfide and hydrogen cyanide detectors, employing aspirating bulbs to measure the volume of air sampled, indicate concentrations by the length of coloration in the indicator tubes. Sufficiently accurate results for control work may be obtained rapidly with these detectors.

The Hoolamite, or iodine pentoxide-sulfuric acid detector for carbon monoxide, though yielding rapid results, is perhaps not as sensitive as the palladium chloride ampoules which are fairly reliable at ordinary temperatures. For greater accuracy and dependability however, the M.S.A. carbon monoxide indicator employing a catalyst, hopcalite, is much more desirable. In this instrument, carbon monoxide is oxidized to carbon dioxide with evolution of heat which is measured by thermocouples and a meter. This indicator should be checked periodically with a 0.1 per cent carbon monoxide air mixture, and in the case of very important determinations, it should be checked before and after use.

Several of these aforementioned tests are influenced by interfering gases or vapors and therefore cannot always be depended upon to yield results of great accuracy, but they are all useful in control work.

The halide leak detector,[21] a methanol torch with sampling tube and copper cone, can be used to detect organic or inorganic halogen vapors qualitatively and has been proposed as a semi-quantitative measure for some halogenated hydrocarbons.[22, 11] In this device, halogens impart a blue green color to a flame contacting a copper cone. The intensity of the color increases with the concentration of halogen.

3. PHYSICAL MEANS

The most useful of all physical methods for determining gases is the interferometer. It can be used to determine any gas, but in industrial hygiene it is especially adaptable to the relatively inert gases with refractive indices sufficiently different from that of air, the usual standard of comparison. The accuracy of the interferometer increases with the refractivity of the gas and the length of the gas chamber. The 50 cm. instrument with metal gas chambers is readily portable and satisfactory for field use. Almost instantaneous results are obtained, permitting the determination of maximum, minimum, and average concentrations, or the following of a changing concentration through its cycles. Concentrations can be computed from interferometer readings and refractivity data.[23] When the refractivities and relative proportions of the components of a mixture are known, the actual percentage of each can be computed from the interferometer reading. Here, as in the charcoal and silica gel absorption methods for solvent vapors, water vapor and carbon dioxide must either be removed or taken into account. Unfortunately, soda lime and dehydrating agents usually employed remove many gases and vapors which otherwise might be satisfactorily determined. Notable among the vapors partly or completely lost by methods based on initial removal of water vapor and carbon dioxide, are methyl and ethyl cellosolve, esters, lower alcohols, pyridine, dioxane, furfural and dichloroethyl ether.

Another convenient instrument is the combustible gas indicator which is available in a variety of sizes and types. Although some of these instruments have a high sensitivity, their greatest field of application is in the higher concentrations—upward of 0.1 per cent gas by volume. They are especially useful in locating sources of contaminating gases and vapors in fire and explosion prevention, but have their application also to industrial hygiene surveys. Automatic types for continuous [20] control or recording are available.

A method based on selective light wave absorption has been developed and applied to the field determination of gases and vapors, especially mercury [24] and trichloroethylene.[25] The instruments used are very sensitive ultra-violet photometers and their operation depends upon the specific absorption of bands of ultra-violet light by certain vapors. The Tri-Per-Analyzer (Dupont) is said to have the following sensitivity in the p.p.m. per scale division:

Mercury, 0.0001; tetraethyl lead, 0.13; xylene, 0.2; monochlorobenzene, 0.3; aniline, 0.3; perchlorethylene, 0.5; toluene, 1.0; chloroprene, 1.0; benzene, 1.2; vinyl acetylene, 2.0; phosgene, 5.; acetone, 5.; ethylbenzene, 5.; pentachlorethane, 7.; hydrogen sulfide, 8.; trichloroethylene, 10.; carbon disulphide, 12.; heptane, 25.; gasoline (Blue Sonoco), 50.

The device does not respond to:

Methylene chloride; carbon tetrachloride; dichloro-difluoro methane; ethylene dichloride; tetrachlorethane; chloroform; methyl chloride; vinyl chloride; methyl, ethyl, and amyl alcohol; ethyl acetate; ethyl and methyl cellosolve; water vapor.

Other research now in progress indicates that selective absorption in the infra-red and radio wave ranges will permit of high selectivity with screening out of interference.

A method employing vapor tension for the determination of solvent vapors has recently been developed.[26, 27] It may prove practical for field use.

Thermal conductivity [28] has been successfully applied in the analysis of certain gases. Although it serves as a rapid continuous recording method, it is not available in a portable field device.

The Edwards Gas Density Balance [29] for determining slight changes in density between air and gas-air mixtures is useful and rapid in gas analysis but is not sufficiently accurate for the threshold concentrations of most toxic gases.

SUMMARY

The determination of gases in the air can be accomplished by various methods which should be selected to fit the particular situation encountered. Convenience, speed, accuracy, and portability are the most important qualifications. All analytical methods should be tried in synthetic atmospheres in the laboratory before use in the field. The ability to recognize odors and their intensity is a material aid. Many of the rapid methods which may not give a high degree of accuracy are yet entirely suited to routine industrial hygiene work. Specific methods are discussed.

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DISCUSSION

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IN the introductory portions of his paper Mr. Patty has presented concisely an excellent portrayal of the problems confronting the industrial hygienist in the field of air analysis. He has emphasized the fact that no set rules of procedure can be laid down because of the complexity of the situations that may arise, and that for this reason workers in this field have need for ingenuity and resourcefulness to conduct their studies successfully. One is constantly faced by combinations and variations of conditions that demand a thorough understanding of the principles involved in the various analytical procedures if reliable results are to be obtained and a true picture of the situation secured. Consideration must be given to all the conditions that may attend contamination of the atmosphere; for example, sampling an atmosphere containing vapors of volatile liquids constitutes one type of problem, that is, the selection of suitable methods for determining these vapors, regarding them as identical with the materials from which they had their source, but existing in the vapor phase rather than the liquid. However, if the air is contaminated by products of combustion or thermal decomposition, an entirely different situation exists, and due consideration must be given to all the possible products that may result from the reactions involved.

This paper also calls attention to the distinction that may be drawn between

field surveys and research conducted in the laboratory. In survey work interest is often centered mainly in the order of the concentrations of atmospheric contaminants rather than in their determination with the ultimate degree of accuracy. This is not intended as condoning careless or slipshod work, but is meant to show that time and energy may be wasted in trying to make determinations accurate to 1 per cent, when conditions may change 100 per cent in a very short interval. The conduct of research to secure fundamental information is a different matter; in work of this nature too much emphasis cannot be placed on accuracy in analytical work. As Mr. Patty has stated, confidence in published data diminishes rapidly if the reader is not convinced from the start that the analytical part of the investigation has been carried on in a manner above suspicion. This is true, not only in the field of industrial hygiene, but in any field where conclusions must be drawn largely from conditions established or determined by analytical results.

Another point in this paper worthy of comment is the mention of need for careful study and experimentation with any analytical method in the laboratory before it is applied in field surveys. The actual analysis of synthetic mixtures is the best practical approach to a full understanding of a method. In many instances an hour's manipulation of apparatus is worth more than a week spent in reading a description of the procedure. Furthermore, experience in technic gained in the laboratory may give rise to new ideas for design or manipulation that will simplify operations when the method is applied in field studies. It is far better to learn the limitations of an analytical method in the laboratory, and thus know the uses to which it can be put, than to start a survey in the field with an untried method and find that it has shortcomings that may render it entirely inadequate for the situation at hand.

Mr. Patty has stressed the importance of learning to evaluate concentrations of odorous materials by the sense of smell. Although not an infallible method, estimation by odor intensity is often a most valuable guide, and in many instances may give the practical answer to problems that arise in industry, without further investigation. For example, if air contains ammonia, the investigator knows, without question, after one or two inhalations of the atmosphere whether the odor is faint, moderate, strong, or intolerable. If the odor intensity is such that it cannot be borne without discomfort, obviously the thing to do is to correct the situation by removing the source of contamination or by increasing ventilation. Analysis of the air will produce some figures for the records, which may be of academic interest, but it will not rid the atmosphere of ammonia which, after all, was the ultimate necessity.

A number of methods of air sampling, applicable in industrial hygiene field surveys, have been described. In determining atmospheric contaminants, the investigator should always bear in mind that, to obtain reliable results, just as much thought and care must be exercised in sampling as in analysis. If air samples are not properly collected and are not representative of the atmosphere sampled, the analytical results will be in error, no matter how excellent the analytical method, nor how careful and painstaking the analyst may be. In other words, the results can be no better than the samples. In selection of sampling methods consideration must be given to the physical and chemical properties of the materials to be sampled, as serious errors may result from ignoring factors such as solubility or reactivity of the gases in question. I recall an oversight of this nature that serves as an excellent example of what

not to do. A man collected samples of air for determination of sulfur dioxide by filling bottles with water and emptying them at the desired locations. When informed that this method of sampling was not suitable when sulfur dioxide was to be determined, he replied that he could not see why the samples were not all right, as he had used pure, distilled water to fill those bottles. He had entirely overlooked the fact that sulfur dioxide is quite soluble in water, and that as the water was discharged from the bottles it would dissolve, and carry with it, a large proportion of the sulfur dioxide in the air.

Mr. Patty has called attention to portable indicating or analyzing devices that may be used to advantage. Among instruments of this type are the interferometer, the carbon monoxide indicator, combustible gas indicator, and detectors for hydrogen sulfide and hydrogen cyanide. Devices of this nature are decidedly advantageous in field studies as they permit the investigator to locate localized high concentrations of contaminants in atmospheres that are not homogeneous, whereas in collecting samples for subsequent chemical analysis there is always the possibility that these high concentrations may have been missed.

Furthermore, the indications furnished by these instruments give an immediate answer to the problem at hand, and in many instances are sufficiently accurate to warrant dispensing with time consuming collection and analysis of samples.

However, in using these devices one should not fall into the habit of regarding them as infallible and self-sufficient instruments that require no more attention from the operator than the closing of a switch or the compressing of a rubber bulb. They should be regarded in the same light as any other analytical methods, requiring the same degree of care in operation if reliable results are to be obtained. The operating principles should be studied thoroughly so that the user is entirely familiar with the possible applications and the limitations of these instruments.

Mr. Patty is to be commended for the amount of information he has included in this paper, and for the fact that he has contributed freely from his own studies and observations.

The Problem of Malaria Mortality*

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DESPITE four decades of malaria prevention through mosquito eradication, from 2,500 to 4,500 deaths per year are certified in the United States as due to malaria. In the past 10 years 37,073 deaths from malaria have been reported. Authorities estimate that from 1,000,000 to 4,000,000 persons suffer from this disease annually in the United States. It is evident that the malaria problem is still unsolved and that anything approaching complete elimination through the eradication of its mosquito vector will be a long procedure. The problem of malaria deaths warrants an immediate, direct attack.

It is paradoxical that we should have such a large number of deaths from malaria, a disease in which an accurate, rapid diagnosis is usually relatively easy, in addition to the fact that it is one of the few diseases for which we have specific drugs. If the diagnosis and treatment were obscure and ineffective, the excessive malaria mortality could be accounted for as a natural consequence; such is not the case. The question at once arises as to why the malaria death rate in Southern United States remains so high.

It is commonly held by the population in the malarious areas that they are well qualified by experience and close association with malaria both to diagnose the disease and adequately treat it. In endemic areas, fever or chills, of whatever source or type are usually attributed to "a touch of malaria" and frequently little attention is given the illness, which is considered of minor importance and placed in the same category as the common cold; yet thousands of these people die annually from malaria. Why is the malaria death rate in the Negro, reputedly partially immune to at least one species of parasite, usually much higher than that of the white race in the same areas? What are the habits, environmental, and economic conditions of the Negro that lead to such a different death rate?

Unquestionably, early diagnosis and adequate therapy are essential to successful treatment of malaria and the prevention of death. How important in the causation of malaria deaths is the failure to seek an early diagnosis? What are the important factors responsible for the delay in seeking medical aid? Once medical aid is obtained and the diagnosis made how adequate is the treatment?

The data upon which this discussion is based were secured from questionnaires sent to Georgia physicians certifying malaria as the cause of death of patients during the summer and fall of 1937. The questionnaires were mailed

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* Read before the Epidemiology Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 17, 1939.

This study was initiated while the author was an officer of the U. S. Public Health Service.

as soon as the death certificates were received by the State Department of Health.* Information upon 101 persons reported to have died from malaria was secured; 53 white and 48 colored; 53 males and 48 females. A questionnaire filled out by a physician who was not anticipating the questions when treating the patient is open to inaccuracies. Data that the physicians indicated were questionable were omitted in tabulating the results.

The group studied represents a fair cross-section of the type of person dying from malaria in this country. The medical facilities available to them are typical of our South. Their habits of self-medication and the diagnosis and treatment given by their physicians probably are not greatly unlike that common in the rural South, the endemic center of malaria in the United States.

The age distribution is shown in Table 2. The greatest number of deaths occurred in children under 5 years and adults past middle age; the lowest in the 5–9 and 10–14 year age groups. Thus our sample, though small, has an age distribution and, in general, a death rate similar to the distribution of malaria deaths for the country as a whole.

TABLE 1

Malaria Mortality U. S. Registration Area, 1928–1937

Year	White	Negro	Total
1928	2,170	1,997	4,167
1929	2,176	1,908	4,084
1930	1,669	1,734	3,403
1931	1,310	1,226	2,536
1932	1,308	1,260	2,568
1933	2,675	2,003	4,678
1934	2,493	2,027	4,530
1935	2,575	1,860	4,435
1936	2,145	1,798	3,943
1937			2,729
			37,073

LENGTH OF TIME PATIENT WAS ILL BEFORE CALLING A PHYSICIAN

In any disease for which a specific treatment is available the prime requisites for successful cure are early diagnosis and treatment. Our data indicate they are frequently neglected by those who later succumb to malaria (Table 3).

TABLE 2

Age Distribution of Types of Malaria and Complications Encountered

Age →	Under 1	1–4	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65+	Total
Age distribution of patients' deaths	5	7	3	2	5	11	13	9	14	12	17	101
Cerebral malaria	4	5	3	1	1	3	4	3	5	3	5	37
Hemoglobinuria	1	2	2	1	2	2	3	4	2	3	0	22
Complications												
Pneumonia	0	2	0	0	0	2	2	3	1	1	1	12
Nephritis	0	1	0	0	0	1	1	4	1	0	1	9
Cardiac disease	0	0	0	0	1	0	1	0	2	1	9	14
All other	2	2	0	0	2	0	4	0	3	3	3	19
Complications all types—Males	0	2	0	0	1	2	2	1	5	1	10	25
Complications all types—Females	2	3	0	0	2	1	6	6	2	4	4	30

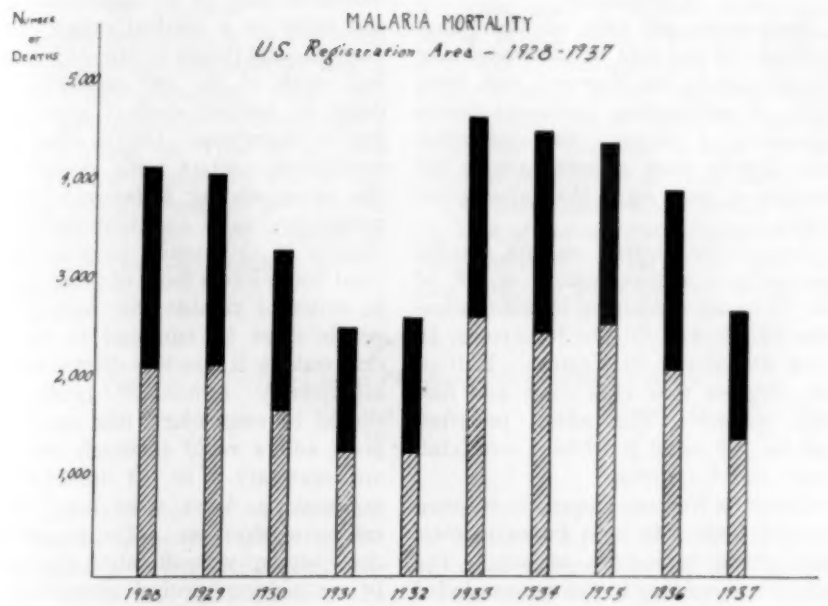
TABLE 3

Duration of Illness Before Calling a Physician

	Days Ill							
	0–2	3–6	7–14	15–21	22–28	29+	Not Given	Total Cases
White	16	9	13	3	0	6	6	53
Negro	3	6	17	4	1	6	11	48

* I wish to express my appreciation to Dr. R. F. Abercrombie, Commissioner of Health, and Butler Tombs, Chief of the Bureau of Vital Statistics, for their coöperation in this study.

FIGURE 1



Approximately 50 per cent of the whites and 75 per cent of the Negroes were ill a week or longer before calling a physician, and no less than 13 per cent of the whites and 16 per cent of the Negroes were sick a month before seeking medical aid. Approximately 10 per cent of the patients died the day a physician was first called, and 28 per cent died within 2 days after. A number were moribund and the most rapid diagnosis and skillful treatment would have been without avail. On the other hand 34 per cent of the whites and 8 per cent of the Negroes called a doctor during the first 2 days of illness and, despite early diagnosis and treatment, died. Nineteen per cent of the whites and 16 per cent of the Negroes called a doctor from the 3rd to 6th day of illness. In such instances one suspects that either the strain of malaria was unusually lethal or that treatment was not sufficiently vigorous.

It is interesting and quite significant that the Negroes in general were ill much longer than the whites before seeking medical aid, probably an important factor in the high death rate from malaria among Negroes. It is possible that the Negro, with his relative immunity to at least one species of parasite, particularly benign tertian, may suffer less symptomatically from malaria and hence be slower to feel the need of medical aid. It is also unquestionable that ignorance and poverty play an important rôle in delayed medical attention for the Negro. A farm laborer earning a dollar a day or less feels he cannot afford the luxury of medical care for what he considers a minor ailment such as chills and fever.

It is unfortunate that many persons when told they have malaria feel that all that is necessary to control this "natural and mild infection" is a few doses of chill tonic or a round or two of quinine.

SELF-MEDICATION BEFORE CALLING A PHYSICIAN

Sixty-seven per cent of the group studied (57 per cent of the whites and 79 per cent of the Negroes) took some form of anti-malaria treatment before consulting a doctor. Self-medication was slightly more common among the females of both races than among the males.

Data were secured on the specific anti-malaria self-medication of 38 of the 68 persons indulging in self-medication (Table 4). Of the 38 persons, 18 were whites and 20 Negroes. Half of the Negroes took chill tonic and half took quinine. The whites preferred quinine, 12 using it while 4 took chill tonic, and 2 atabrine.

That the Negroes frequently resorted to chill tonic may be a factor in their high death rate from malaria. The amount of quinine in the recommended dose of chill tonic is frequently insufficient to check severe malaria. In general the amount of quinine taken was insufficient—5 to 15 grains was the usual daily dose. No information on the exact dosage of chill tonic or atabrine was available. Nineteen of the 22 persons using self-medication for various lengths of time showed malaria organisms in their blood, which, with the fact that they continued to have symptoms, grew progressively weaker, and finally consulted a physician, is conclusive evidence of the inadequacy of the self-medication employed.

The median length of time before seeking medical aid for those indulging in self-medication was 10 days and for those who refrained from self-medication 3 days. It is apparent that self-treatment may be an important factor and delay to a marked extent correct diagnosis and proper treatment. Doubtless much of the self-medication and delay in seeking medical attention is due to the expense. On the other hand, continuous contact with malaria and the never ending statements through newspaper, radio and billboard of the efficacy of chill tonics have lulled the rural South into a sense of false security. In order to combat this feeling these people must be educated to the fact that malaria is a serious disease and not infrequently terminates fatally. It should be emphasized that early diagnosis and a rapid thorough treatment are necessary. In 33 instances, no anti-malaria drugs were taken before calling a physician. The majority of these persons were ill only a day or two before seeking medical attention. On the other hand, 10 persons experienced chills and fever for 1 to 4 weeks before calling a doctor and, during this time, according to the doctor's statement, took no anti-malaria medication.

Of the 33 persons refraining from self-medication 23 were white and 10 were Negroes. Due to the widespread knowledge of cause and treatment of chills in the malarious areas one would expect the whites to rely more on self-medication than the figures indicate (see Table 4). However, much of the apparent failure to attempt self-cure among the whites was probably due to the fact that many of them did not recognize the nature of their disease and therefore sought medical attention after a day or two of sickness.

TABLE 4

Self Medication Before Consulting a Physician

	Quinine	*Chill Tonic*	*Atabrine*	*Drug Not Specified*	*None*	*Total*
White	12	4	2	12	23	53
Negro	10	10	0	18	10	48

MEDICAL SERVICE TO PATIENTS DYING OF MALARIA

If malaria deaths are to be prevented early diagnosis and adequate therapy is essential. Unfortunately such procedures are frequently neglected, but a large proportion of those dying were under medical supervision for a considerable period. Fourteen persons (14 per cent of the total) died a month or longer after seeking medical advice (Table 5).

TABLE 5

Duration of Treatment under Physician's Direction Before Death

Days →	*0–2*	*3–6*	*7–14*	*15–21*	*22–28*	*29+*	*Not Given*	*Total*
White	12	15	11	1	0	3	9	53
Negro	11	9	11	4	2	9	2	48

It is generally held by malariologists that malaria patients under a physician's care for 2 weeks if treated adequately rarely die of malaria. In hospital practice or among persons who can afford constant medical supervision this may be the case, but in a rural population of low economic level "under a doctor's care" often means a single trip to his office and a prescription. This is about all that can be afforded by most rural laborers and tenants. Unfortunately the diagnosis of malaria is often hailed with relief by the patient who feels adequately informed to treat his own disease. Occasionally doctors hold the same belief.

Quinine was the doctor's drug of first choice in the treatment of the patients in our series, and was prescribed in approximately two-thirds of the cases.

Drug	*Patients*
Quinine	56
Atabrine	17
Quinine and Atabrine	8
Atabrine and Plasmoquine	3
Quinine, Atabrine and Plasmoquine	1
Chill Tonic	2
Not Stated	8
No Medication	6
Total	101

Atabrine and quinine with atabrine were also used in approximately one-fourth of the cases. No anti-malaria drug was administered to 6 patients as death occurred before treatment could be instituted. It is comforting and an indication of progress to note the infrequent prescribing of chill tonics.

Treatment was given by mouth in 70 per cent of the cases and intravenously, intramuscularly, alone or in combination with oral administration in the remainder. Intravenous and intramuscular medication was twice as frequent among the whites as among the Negroes.

Approximately 40 per cent of 78 persons about whom complete information was secured did not receive what is considered by international malaria authorities adequate therapy to control a severe attack of malaria. Approximately 30 per cent of the whites and 50 per cent of the Negroes were not adequately treated. The inadequacy of treatment of Negroes may explain in part, their high death rate from malaria.

Meleney [1] found that approximately 50 per cent of those dying of malaria in Tennessee in 1935 were given inadequate treatment. His figures are confirmed by our data and suggest that this condition, which has been found in 2 states, may be present in other sections of the malaria region of the South.

Blood smear examinations were made in diagnosis in 52 of the 101 cases—47 were positive. Meleney reported that blood examination was done by the doctors in approximately 40 per cent of the cases of malaria in Tennessee that terminated fatally. Dauer and Faust [2] reported that blood examinations were

made in 34 per cent of the whites and 29 per cent of the Negroes dying of malaria in Mississippi. In our series, blood examinations were made 50 per cent more frequently in whites than in Negroes. Thirty-one were made by the physician, 9 by the hospital laboratory or private technician, 7 by city laboratories, and 4 by the state laboratory. Of the positive blood smears 47 per cent were classified as *Plasmodium falciparum*, 44.4 per cent *Plasmodium vivax*, 4.4 per cent *Plasmodium malariae*, and 2.2 per cent as mixed *Plasmodium vivax and Plasmodium falciparum* (Table 6). Such an incidence of *Plasmodium vivax*, as the cause of death in adults is most unusual and suggests two possibilities: either an unusually pernicious type of *Plasmodium vivax* or error in diagnosing the species. The fact that death of 7 Negroes was attributed to *Plasmodium vivax*, a species to which they possess some immunity, while only 9 were attributed to *Plasmodium falciparum* suggests the possibility of error in diagnosis. I am inclined to agree with a number of malariologists who consider a large percentage of malaria deaths in adults attributed to *Plasmodium vivax* as errors in species diagnosis. This question could be readily solved by sending the blood smears to the state laboratory for confirmation. None of the blood of the cases in this series examined by the state laboratory contained *Plasmodium vivax*.

TABLE 6

Species of Malaria Parasite Reported Found in Blood Examination

Species →	*P. Vivax*	*P. Falciparum*	*P. Vivax and P. Falciparum*	*P. Malariae*	*Not Given*	*Neg.*	*Total*
White	13	14	0	0	0	5	32
Negro	7	9	1	2	1	0	20

Complications were reported in 55 of the 101 patients (Table 2). Cardiac disease (14 times) and pneumonia (12 times) were the most common complications. Acute nephritis was reported 9 times. Other complications noted twice or oftener were cerebral hemorrhage, influenza, and acute intestinal disturbances. The cardiac complications were most common in the age group 65 and over, and were not reported in any individuals under 15 years of age. In general, complications were most frequent in the very young and old groups. No complications were reported in the 5–14 age group.

Complications occurred with equal frequency among the males and females. Whereas they occurred most frequently in males 65 and over, among the females the greatest frequency was among the 25–44 year age group. Nephritis was the most common complication of this group. Whites and Negroes had approximately equal complication rates.

Twenty-two of the 101 cases were described as hemoglobinuric, with the condition approximately twice as common among whites as Negroes (Table 7). Of the cases reported as hemoglobinuric 6 were attributed to *Plasmodium falciparum*, 5 to *Plasmodium vivax*, 1 to a mixed infection of the two,

TABLE 7

Occurrence of Hemoglobinuria in Relation to Species of Parasite

	P. Vivax	*P. Falciparum*	*P. Vivax and P. Falciparum*	*P. Malariae*	*Species Unknown*	*Total*
White	3	4	0	0	7	14
Negro	2	2	1	1	2	8

and 1 to *Plasmodium malariae* (Table 7). The absence of hemoglobinuria in any of the 17 persons over 65 is of especial interest (Table 2). No record of the species of malaria was available in the remaining 10 cases.

Cerebral manifestations were reported in 37 instances. In patients infected with *Plasmodium vivax* as well as those with *Plasmodium falciparum* stupor and convulsions were most common in children, while stupor followed by coma was the characteristic picture in adults. Twelve of 15 children under 9 years dying of malaria exhibited cerebral manifestations of the disease. A number of patients did not come under the care of a physician until comatose.

DISCUSSION

Diagnosis of malaria should be based upon blood examination. Chills and fevers are too frequently associated with other diseases to serve as the sole criterion for diagnosis. The present study revealed that blood examinations were resorted to in 51 per cent of the cases. This no doubt represents a considerable increase over blood smear diagnosis for malaria as practised twenty years ago. One however is tempted to question the accuracy of the species diagnosis, for *Plasmodium vivax* was reported as the cause of fatal infection approximately as frequently as was *Plasmodium falciparum*. This is strongly indicative of diagnostic error for it is generally agreed by malariologists that *Plasmodium vivax* seldom causes death except in the very young or old. It is often argued that malaria is malaria and the same quinine treatment will cure all three types, so why bother about the species. It is important, however, for a physician to know when he is dealing with the malignant tertian (*Plasmodium falciparum*) in order that he may follow and treat the patient vigorously and to best advantage.

It is true that quinine will destroy the asexual forms of all three malaria plasmodia. On the other hand, it is only slightly destructive of the gametocytes of *Plasmodium vivax* and *Plasmodium malariae*. Quinine has little or no effect upon the gametocytes of *Plasmodium falciparum*.

Inadequate therapy by the physician was unquestionably the important factor in the death of a number of the patients in the present series. Meleney [1] attributes the death of 40 per cent of his malaria series to this cause.

Failure to use adequate therapy along with inaccurate or no blood examination is a reflection on medical education. The biology, diagnosis, and treatment of parasitic diseases including malaria are badly neglected in many medical schools including those in the South. Doctors are graduated who do not know a malaria infected red blood cell from a small lymphocyte or a platelet superimposed on a red cell. The Chicago amebic dysentery epidemic and its humiliating sequellae along with the malaria mortality should be sufficient to convince the skeptical of the importance of knowledge of these and other parasitic diseases. Education of men in practice is necessary, since many of them have a meager background concerning malaria. This may be done through their medical society meetings, special lectures, demonstrations, etc. State departments of health can coöperate in this education, through lending specialists to address and demonstrate procedures to various medical groups. The county health officer could be equipped to stain and diagnose malaria and offer this educational service to the physicians in his area.

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Further Observations on the Rapid Phosphatase Test*

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THE importance attached to pasteurization by medical science and public health officials warrants every effort to establish effective means for controlling the process. The reliance which consumers place on the term "pasteurized milk" requires constant vigilance by public health administrators and the dairy industry that regulations governing this procedure be strictly enforced. Some plants in operation today are capable of pasteurizing in excess of 25,000 quarts of milk per hour and many have a capacity of 5,000 quarts per hour. These significant engineering advances must be followed by a corresponding improvement in inspection and control in order to guarantee a safe milk supply. It is obviously impossible to judge from physical inspection alone whether equipment is producing efficiently pasteurized milk day in and day out.

The introduction of the phosphatase test by Kay and Graham [1] was a long step forward in aiding the supervision of the operating efficiency of pasteurizing plants. But where a large number of samples must be examined, as in routine laboratory or plant work, a relatively simple and rapid method is essential. We have devised a modified phosphatase test which seemingly fills these requirements and, in addition, is relatively inexpensive.[2-5]

Two technics for conducting this test have been developed: an exact laboratory procedure requiring about 1 hour for completion, and a diagnostic short test or "field" test suitable for non-technically trained personnel, which requires about 15 minutes for completion. The field test allows testing at point of sampling, or during plant operation so that irregularities can be detected and the distribution of an improperly pasteurized product prevented. Through use of tablets, preparation of the two necessary reagents is greatly simplified. The two procedures, together with the preparation of suitable inorganic permanent standards, are detailed in the *Standard Methods for the Examination of Dairy Products*.[5]

Because of the simplicity and economy of the two technics, the New York City Department of Health has been able to make more than 150,000 tests (both laboratory and field tests)* in the past 2 years affording a daily cross-section of the city milk

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* The cost of these determinations was less than ½ cent per sample, including all reagents and filter paper, but exclusive of labor.

supply. The Chemical Laboratory has found it possible to make 500 determinations in a single day. Every sample of milk and cream submitted to the laboratories for routine chemical and bacteriological examinations, and all dairy products involved in suspected food poisonings are tested for efficiency of pasteurization. A report is available, when necessary, within a few minutes after receipt of the sample and in the majority of instances, the same day the milk is pasteurized. When irregularities in pasteurization are indicated, an inspection is made at the pasteurizing plant immediately, the cause determined by means of the field test; corrective measures are taken, and samples submitted to the laboratory for confirmation. A product found to be improperly pasteurized is embargoed and released only for manufacturing purposes after repasteurization. As indicated,[6] the rapid field test has a remarkable educational and psychological value. Plant employees and operators are more impressed by a test performed in their presence than they would be by receiving a verbal or written report the next day.

Of the possible causes of improper pasteurization, namely, insufficient holding, insufficient heating, or the inadvertent addition of raw milk, the last cause is the most serious. The generally accepted requirements for pasteurization (143° F. for 30 minutes) present a safety factor above the minimum time-temperature conditions necessary to destroy the common pathogenic organisms found in raw milk. But the addition of even a small percentage of raw milk to a quantity of otherwise pasteurized milk completely destroys the safety factor. Therefore, from the public health viewpoint, the primary task for the phosphatase test is to detect those samples in which there is a likelihood of the addition of small quantities of raw milk or a deficiency in time of heating or temperature of heating sufficient to menace or destroy the safety factor. The problem is complicated by the fact that the improper pasteurization may result from a combination of the above enumerated causes. It is also conceivable that the amount of dilution of the raw milk by a large quantity of pasteurized milk would be so great that the phosphatase test and its modifications thus far proposed would not be able to detect the condition.

Practical considerations govern the limits of sensitivity of any test. The two technics which we have thus far proposed will readily detect the addition of 0.1 per cent raw milk or a drop of 1° in temperature. Where temperatures of pasteurization higher than 143° F. are utilized, the detection of the addition of 0.1 per cent raw milk is more certain, and conversely, where temperatures lower than 143° F. are used, the detection of this small amount of raw milk becomes more difficult because of the residual phosphatase present in the milk at the lower temperatures of heat treatment.

Careful repetition of earlier experiments has indicated that there is no advantage to be gained by the employment of magnesium salts in concentration from .01M to .001M as enzyme catalysts. The sensitivity of both the laboratory test and the field test can be greatly increased by prolonging the period of incubation as illustrated in Table 1.

By means of a 24 hour incubation period it is possible to detect the addition of as little as 0.01 per cent raw milk. However, a 3 hour incubation period should be more than adequate for most purposes, and has in fact been found satisfactory in Europe where higher temperatures of pasteurization prevail. (Personal communications: F. K. Neave, National Institute for Research in Dairying, England; and Pro-

TABLE 1

Effect of Increasing Incubation Period in the Laboratory Test—Results Expressed in Phosphatase Units

	Incubation Period in Hours				Gilcreas-Davis Method
	One	Three	Six	Sixteen	Twenty-four Hours Incubation mg. Phenol per 0.5 cc. Milk
Pasteurized milk control (143° F.—30 minutes)	0	0	1+	3.5+	0.04
" +0.05% raw milk	1	2	5	7.5+	0.04
" +0.10% raw milk	2	3.5	5+	15	0.05
" +0.20% raw milk	2+	5	7.5+	20	0.06–0.09
" +0.50% raw milk	5	7.5+	15+	25	0.09–0.15

fessor Aage Jepson, Royal Veterinary College, Denmark.) For practical considerations, the 1 hour incubation period is still recommended. It should be noted, in passing, that if the butyl alcohol procedure be utilized to extract the developed indophenol from the serum of the laboratory method, the sensitivity is further enhanced. Present investigations to interpret a positive finding of improper pasteurization as due to the addition of raw milk rather than to other factors of operation, are not conclusive.

ACTION OF PRESERVATIVES

Hahn and Tracy [7] have recommended that mercuric chloride be used as a preservative when necessary in samples which are to be examined by the phosphatase test. This was in conflict with our own experiments which had indicated that borax was the only common preservative which could be effectively so employed. Accordingly, we repeated our experiments, utilizing the amounts and preservatives specified by the aforementioned authors. The results are expressed in Table 2, confirming our previous observation regarding the use of borax. A possible explanation of the difference between our results and those of Hahn and Tracy is that they utilized a completely pasteurized milk for their investigation, whereas we employed a milk containing 0.5 per cent raw milk,

TABLE 2

Relation of the Presence of Preservatives to the Accuracy of the Laboratory Phosphatase Test

(Expressed in phosphatase units)

	Time of Storage					
	One Day		Three Days		Five Days	
Preservative Added	Past. Milk	½% Raw	Past. Milk	½% Raw	Past. Milk	½% Raw
None	0	5	0	3.5+	0	3.5+
Mercuric chloride	0	0	0	0	0	0
Sodium salicylate	5—	7.5	5	5+	3.5	7.5
Borax	0	5	0	3.5+	0	3.5+
Hydrogen peroxide	0	5	0	3.5	0	3.5
Formaldehyde	0	2	0	1	0	1

as well as a pasteurized milk. The preservatives were added as follows:

1. Mercuric chloride — 1 tablet to ½ pint of milk
2. Sodium salicylate — 1 gram to ½ pint of milk
3. Borax — 2 grams to ½ pint of milk
4. Hydrogen peroxide — 2 cc. (7.5%) to ½ pint of milk
5. Formaldehyde — 2 cc. to ½ pint of milk

When the field test was employed on the above samples, results similar to the laboratory test were obtained except that initially the hydrogen peroxide treated sample gave low results. The positive result obtained on the pasteurized milk to which the salicylate had been added is due to the fact that the salicylate is a member of the class of phenols which will react with the 2,6 dibromoquinonechloroimide (BQC) resulting in an indophenol blue.

In applying the rapid phosphatase test to goats' milk, it was found that the raw milk yielded only 15 to 50 units. Whether this represents the maximum phosphatase present in goats' milk, or whether a change in the technic of the test, particularly the pH conditions, is necessary, cannot authoritatively be stated at this time. Under present circumstances the addition of even 5 per cent goats' raw milk to goats' pasteurized milk cannot be detected.

Application of this test to high temperature-short time pasteurization of milk has not been adequately studied. From the limited data available, it would appear that heating at 160° F. for 15 seconds yields a negative result on the field test and on the 1 hour laboratory procedure, with a maximum of 5 units for 24 hour incubation.

SOURCES OF ERROR IN THE RAPID PHOSPHATASE TEST

Substrate—Since the disodium phenyl phosphate solution is susceptible to hydrolysis even under refrigeration, with the liberation of phenol, it is strongly urged that as a practical measure this solution be freshly prepared sufficient for immediate needs. The solution can be quickly and conveniently prepared whether reagents or tablets are used.

The 2,6 dibromoquinonechloroimide (BQC) solution is also susceptible to decomposition when not stored under refrigeration or when kept for too long a period even under refrigeration. When the characteristic light yellow color of the alcholic solution changes to brown, the reagent is no longer suitable for use. It may be lacking in sensitivity and thus yield a false negative test, or it may result in a false positive test through the formation of a decomposition product similar in color to the indophenol blue which can be detected in that the butyl alcohol extracted color exhibits dichromatism showing red hues in direct light and blue in reflected light. At times even the powdered or crystalline BQC, through decomposition or fault in manufacturing exhibits this dichromatism. Therefore, we advocate the testing of each new batch of this reagent by conducting the test on a boiled milk sample and a similar sample to which has been added 0.5 per cent of raw milk. The former should show no color, while the latter should not exhibit dichromatism, and should yield approximately 5 units of color.

As a precautionary measure in the laboratory test, we advocate the inclusion of the above mentioned control samples with each day's run. This affords a double check on both reagents and technic. Should the lead acetate solution be permitted to remain in prolonged contact with the milk-substrate mixture before filtration, phenol is pro-

duced for nonspecific reasons. Accordingly, this mixture should be filtered as soon as the proteins and fat coagulate; usually within a minute or two.

Decomposition of reagents during summer temperatures is critically important when using the field test. We cannot too strongly recommend the daily preparation of fresh reagent solutions for this purpose, as well as the thorough cleaning of apparatus, including rubber stoppers, before re-use. Corks should never be substituted for the gum rubber stoppers.

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Incentives and Methods in Health Education—Adult Level The Medical Society View*

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ACCORDING to Dr. Turner, "Health Education has to do with those systematic, continuing or organized procedures, the primary purpose of which is to improve the health attitudes, behavior, or knowledge of individuals or of groups."

It is generally agreed that everyone should possess certain fundamental information about health preservation and disease prevention.

To this end, following the good example set by the American Medical Association in establishing a Bureau of Health and Public Instruction, and in publishing *Hygeia*, certain state and county medical societies have organized public relations bureaus, have published informative bulletins, books, pamphlets, etc., organized and maintained speakers' bureaus, and sponsored radio programs.

MEDICAL SOCIETY OBJECTIVES

In these activities medical societies have made a constructive effort to overcome the mysteries still surrounding medicine, to discourage self-medication, and to make known good health practices and disease prevention measures.

To aid in obtaining objectives sought, medical societies have found it necessary to keep their members informed not only of society activities, but of the actual information being given to the public by society representatives, public health officials, and others associated in these enterprises, including workers of the local Tuberculosis and Health Association. The medical society monthly bulletin therefore, is of great importance as is the frequent mailing of informative material including that provided by the Tuberculosis and Health Association, the American Heart Association, and the Cancer Society, etc. Education of the profession should precede education of the lay public, and the first responsibility of a medical society is to help doctors to meet a growing demand for them to be more articulate.

PHYSICIANS CAN BE BEST HEALTH TEACHERS

Physicians giving timely instruction to individuals and groups can be the most effective health teachers in any community. The greatest handicap to the effective practice of medicine is the

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delay in seeking medical counsel by patients who do not consult a physician until they are sick—often not until they have been sick for a considerable time.

The successful treatment of many diseases demands a knowledge of the disease process in the patient before that patient feels ill. We should not continue to think in terms of the separateness of preventive or curative efforts to reduce death and disease.

There is no question in my mind but that the criticism of the educational campaign on behalf of periodic health examinations voiced by Dr. Edward S. Godfrey, Jr., Commissioner of Health of the State of New York, is justified. Instead of giving up its promotion, we as health educators should see to it that much more attention is given to medical school and postgraduate medical education dealing with presymptomatic studies of apparently well individuals.

HEALTH DEPARTMENT LEADERSHIP ESSENTIAL

In the development of a community health education program the importance of securing the active participation of influential laymen, as well as physicians, nurses, etc., must be recognized. For leadership, one should be able to turn to the local health department, and for coördination of effort, to a community health council, with a health education division providing for representation from the school, the home, and civic groups in the community. Medical advice needed should be provided by the county medical society representatives on the council.

Outstanding health education programs have been carried on by the Health Departments in Detroit and New York City. Attention should be given to the application of their programs to our local community. The Boston Health Education Survey of 1933 by Dr. Turner is of special interest. Its account of the direct health instruction activities carried on in the waiting rooms of the Boston Dispensary Clinics should be studied by those concerned especially with the education of the clinic patient.

GOOD HEALTH BEHAVIOR NEEDS MOTIVATION

Adults like to consider themselves as very different from children. We like to think of ourselves as logical, reasonable human beings. We have a natural and lively thirst for medical knowledge. We pride ourselves on our knowledge. Then we profess to be shocked when the psychologist tells us that all through life emotions, desires, impulses are more important in directing our actions than intellect and idea.[2]

Dr. Victor Heiser comments frankly, "Reasoning man, claiming free will, with laboratory knowledge at his disposal, remains a slave to dietary habits, sacrificing his health and even sometimes his life largely because life is a tissue of habits." "We are surrounded by custom," continues Dr. Heiser, "and we cling to what is familiar."

Our message, to be successful in obtaining a desired result, must, we are told, arouse curiosity, enlist sympathy, and impart information which leads to action. It must be able to stand the test of discussion and deliberation. It must have something to do with our daily living. It must be simple. It must be interesting.[3]

ATTITUDE MOST IMPORTANT

You cannot scare people into taking worth while health measures, but you can convince them of the need for following those procedures which will make them effective, and help others as well as themselves.[4] Most important is our attitude. When that is favorable we are open to conviction. The reasons why action should be taken must be carefully explained. Dr. Alexis Carrel states, "it is impossible to manage one's

life properly without some knowledge of the ways of the human body. In order to conserve health we must have the will to know and the will to act. "Health," concludes Dr. Carrel, "is largely due to the excellence of adaptation." First we must know our own physical assets and liabilities.

PERIODIC HEALTH EXAMINATION VALUABLE

We unqualifiedly recommend as the keystone of an individual health program a periodic health examination. We recognize the value of seeking a doctor's counsel frequently. We believe that everyone should follow a definite set of rules for living to the limit of his capacities. Those of us who are parents will, if we practise what we preach, encourage in our children an inquiring state of mind. We will emphasize the value of good health habits. We will be thankful that school health education services are influencing our children to follow good health practices because they have been proved to be effective.[5]

We who are in health education work, however, cannot limit our activity to advocating certain procedures and correcting misinformation. We must constantly recognize the necessity of popular acceptance of sound campaign objectives.

The contribution of predominantly lay groups in the removal of a social sanction of shame concerning discussion of syphilis is noteworthy. Now that syphilis is known as a communicable disease, rather than a disgrace, and now that the public is willing to talk about gonorrhea as well as syphilis, we must get the public to consider gonococcal infection as deserving of special attention.

CAMPAIGNS STIMULATE ACTION

We must give careful consideration to our participation in nationally organized campaigns.

We find on our calendar—National Social Hygiene Day, Child Health Day, Mother's Day, Tuberculosis Sunday, Cancer Week, and Hard of Hearing Week. Certainly a local health education worker has a responsibility to see to it that his community participates effectively in recognized nation-wide health promotion and disease prevention campaigns.

PUBLICITY PAVES THE WAY

In appraising the various methods of health education, it can be said that publicity paves the way. The press aids in health education. Newspaper stories attract attention and are especially valuable at the time of initiating a project. News space, however, is very limited. News must be reported in positive categorical statements. The disinclination to publish carefully prepared news releases containing committee statements is widespread. The practice of physicians of carefully qualifying health information has led to a practice on the part of the press to turn to the health officer as spokesman for the medical profession, as well as the health department. This places on him an added responsibility, particularly affecting public attitudes on health subjects.

WEEKLY RADIO TALKS EFFECTIVE

The county medical society health education program usually has a weekly radio broadcast as its principal contact with the public. In this program recognition can be given to nation-wide observances in the year's special emphasis periods.

In the weekly radio broadcast, the county society finds the ideal method of presenting "the kind of information your family physician desires you to have, expressed by the voice of a physician you know." While no radio program can stand alone, yet through the maintenance of a regular broadcasting

period, with advance publicity on the subject to be discussed, it is possible to build up a large and responsive audience. Dr. Bauer of the American Medical Association emphasizes the need for repetition of the vital message.

"Every talk," states Dr. Bauer, "should have three constituents: a smile, a tear, and an idea; a bit of humor and a bit of human interest, perhaps of a pathetic character, help to humanize the talk so that it becomes something more than a dry recitation of facts which may be important but not in themselves particularly interesting. The best radio voices are natural. The radio speaker must speak distinctly and slowly enough so that a listener has time to get the meaning of what is being said."[6]

PUBLIC MEETING BEST METHOD

Motion pictures, the radio, newspapers, and exhibits are of distinct value and carry their message to large numbers of people. However, their effect is often but transient, being diluted by a medley of wholly unrelated ideas. The well organized, properly publicized public meeting is, in our opinion, the best means of imparting solid public health information to adults.[7]

MOTION PICTURES AND EXHIBITS ILLUSTRATE MESSAGE

The public is picture minded. A window display is a combination of a poster, a newspaper advertisement, a stage set, and a speech. An exhibit presents an opportunity for a visual discussion of the subject. The use of color is important. Red and blue are best and give weight to your message. People are more interested in other people than in pictures of objects or views of scenes. Dioramas are being used most effectively even though they are rather expensive to construct.

There are those who believe that the mental impression of a lantern slide, good diagram, or wall pictures, well demonstrated, is more lasting than that of a motion picture. Many prefer the voice of a teacher to a "talkie." A chalk talk well given is a most effective teaching medium. There are available new sound motion pictures on tuberculosis, pneumonia, cancer, smallpox vaccination, diabetes control, maternal welfare, and heart disease. A new syphilis control motion picture is being made which can dramatically supplement the speaker and aid in the arousing to action of an audience. These have entertainment as well as educational value.

The New York World's Fair has again demonstrated the pulling force of human curiosity and the interest of the public in many of those subjects previously wrapped up by physicians in a mystic mantle of medical reserve.[8]

That people are willing to have their knowledge tested, and that the results are of interest to everyone is evident by the success of the Quiz Corner at the Fair.[9] That they are interested in their state of health is indicated by the large number of persons who sought a chest x-ray in the demonstration unit sponsored by the Queen's County Medical Society. In spite of our efforts as health educators there is no doubt that there is confusion in the minds of many people as to what *they* should do about tuberculosis or cancer, for example. According to findings reported in recent Gallup polls, many gave a wrong answer to questions asked and had confidence in the correctness of the information they possessed.

LEAFLETS GIVEN ON REQUEST

No longer is the distribution of leaflets conducted on a wholesale basis. It is the prevailing present practice to distribute literature only on request. We may say from our own experience, that contrary to the story of fifteen years ago we, as health educators, are now engaged in meeting a demand for in-

formation rather than in the promotion of certain good slogans.

The physician has come to turn to the health department for help in supplying the demand for new information. Now that health departments have ceased to publicize clinics and have aided the physician by providing needed drugs for treatment, physicians are increasingly turning to the health officer as their best friend.

Having endeavored very briefly to emphasize incentives which lead to action, and methods which get results, I want to call attention for just a moment to the woeful inadequacy of health department provision for health education service.

HEALTH EDUCATION BUDGET ALLOWANCE INADEQUATE

The government of the State of New York, through its Health Department, spent approximately $80,000.00 or 12½ per cent of its total budget last year for its health education service.

With this relatively small budget, the Division of Public Health Education was called to meet the health education needs of more than 6½ million people in upstate New York—an obvious impossibility—yet the proportionate assignment to health education is larger than in any other health department in the country.

PUBLIC SUFFERS BECAUSE OF IGNORANCE

The public still suffers because of ignorance. This can be overcome to a great extent by increased educational activity. The health education possibilities in a health department service are greater today than ever before. They cannot be delegated to the organized medical profession and the voluntary health association which have shown the way to get results. Physicians are prepared to continue to help in meeting the lag between the acquirement of scientific knowledge and an informed public.

SUMMARY OF CONCLUSIONS

1. The periodic health examination is the keystone of a health education program for an individual.
2. Attitude and good health behavior need motivation.
3. Health departments should employ health education directors, develop health education projects, and give needed leadership.
4. Every large community should have a health education council with medical advisers, provided by the county medical society, it being recognized that physicians can be the best health teachers.
5. Every community should list its health education facilities and enlist widespread medical and lay participation.
6. County medical societies should provide medically accurate information and maintain a speaker's bureau and information service.
7. County society weekly radio programs on regular schedule are a most important educational project.
8. Public meetings on health subjects can be very effective, and should be held regularly in addition to nation-wide campaigns which stimulate specific action.
9. Printed matter supplements the spoken word, and exhibits illustrate a single health message. Motion pictures are valuable adjuncts. Leaflets should be given only on request.
10. Health education of adults is as worth while as the health education of school children and is just as productive of results, but its development has not been fully realized.

There is great need for the dissemination to professional groups and to the public of the large store of knowledge on the prevention of disease and the conservation of life which is being accumulated by scientific men. It should be presented in a way which will appeal to men and women and will help them in their individual lives, and result in community good.

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Louis Livingston Seaman Fund

THE New York Academy of Medicine announces the availability of the Louis Livingston Seaman Fund for the furtherance of research in bacteriology and sanitary science. Fifteen hundred dollars may be awarded for assignment in 1940. This fund was established by the will of the late Dr. Louis Livingston Seaman and is administered by a committee of the academy which will receive applications from either institutions or individuals up to October 15. Communications should be addressed to: Dr. Wilson G. Smillie, Chairman, 2 East 103rd Street, New York, N. Y. The fund will be expended only in grants for research in bacteriology or sanitary science.

Diet and Resistance to Infection

III. Genetic Versus Dietary Factors

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IN our earlier publications[1, 2, 3] we reported certain experiments which we interpreted as evidence of influence of maternal diet upon the resistance of the offspring to infection following inoculation with *Salmonella enteritidis*. The comparisons were limited to the descendents of the D line (unselected Swiss) mice. For many previous generations this line had been maintained in the stock of Dr. L. T. Webster at the Rockefeller Institute for Medical Research on Diet A, a diet of bread and milk, supplemented twice a week with a mixture of oats and buckwheat, and once a week with dog biscuit.

On their arrival in our laboratory, all the mice were placed on a modified Steenbock diet of ten ingredients, Diet C (200). After an interval of 2 months, 4 females and 2 males which had been taken at the same time from the same breeding pen at the Rockefeller Institute, were divided into two breeding lots: females 1 and 3 with a male constituted one lot; females 2 and 4 with a male constituted the second lot. The first lot was continued on diet C (200). The second lot was

TABLE 1

Composition of Diets

A—Bread and milk supplemented twice a week with a mixture of oats and buckwheat and once a week with dog biscuit.

B—221	Parts
Ground whole wheat	66.0
Powdered whole milk	33.0
Sodium chloride	1.0

C—200	Parts
Whole ground corn	64.0
Linseed oil meal	16.0
Crude casein	5.0
Wheat germ meal	10.0
Powdered whole milk	5.0
Brewer's yeast	2.0
Ground alfalfa	2.0
Sodium chloride	0.5
Calcium carbonate	0.5
Cod liver oil	1.73

D—212	Parts
Extracted casein	20.0
Sucrose	76.0
Brewer's yeast	10.0
Salt mixture	4.0
Lard	2.0
Cod liver oil	2.0
Wheat germ oil	0.3

E—214—Diet 212 with part of the brewer's yeast autoclaved.

Elementary Composition per 100 Calories

	Calories from			*Milligrams*					
Diet	*Pro.*	*Carb.*	*Fat*	*Ca*	*Mg*	*K*	*Na*	*P*	*Cl*
200	16	68	16	118	19	152	62	90	98
212	19	72	9	149	18	270	43	145	52
221	16	59	25	105	13	199	136	139	232

placed on a Sherman diet of three ingredients, Diet B (221), analogous to the ancestral diet of bread and milk. The composition of these diets is shown in Table 1.

The offspring were segregated, and the selected breeders were sibling-mated. Thus, 4 lines of mice were developed, from the 4 females 1, 2, 3, and 4, and the lines were continued after the first generation by sibling mating, or in a few rare instances, by cousin mating. After the initial changes already mentioned, the diet of each line and its several branches either remained uniform or was changed as indicated in Table 2. About once a month, the offspring of similar age (approximately 6 weeks) from each line and its various branches, were placed on the same experimental diet. Two weeks later they were inoculated with *Salmonella enteritidis* and the percentage survival of each group of mice was tabulated in relation to its ancestral dietary history. It must be observed that a different ancestral dietary history in most instances connoted a different genealogy. Throughout a series of experiments, mice whose ancestors had been kept for several generations on diet C (200), mostly descendents of females 3 and 4, had a percentile survival in inoculation experiments which we have reported [1, 2, 3] as from 43 to 79 per cent; mice whose ancestors had been kept for several generations on diet B (221), most of these being descendents of mouse 2, had a percentile survival which we have reported [1, 2, 3] as from 7.8 to 12.1 per cent. The difference between the two groups had high statistical significance.

In one of our earlier publications [3] we made the following comment:

> These differences in the host resistance of young mice from the two maternal diets appear to be the result of differences in the nutrition of the mother. The possibility of variation in the genetic constitution of D line mice as a result of heterozygous matings cannot as yet be ruled out absolutely, since strict sibling mating has been practised for only eight generations. However, in view of the consistency of the survival responses of progenies from the two maternal diets, this possibility appears remote.

Sibling mating through successive generations gives the greatest likelihood of genetic uniformity in any given litter. On the other hand, sibling mating tends to preserve and perhaps accentuate through successive generations any genetic difference between ancestors at any point in the line of descent.

The genealogical descent of the mice kept through successive generations on the diet of three ingredients, diet B (221), with low survival of inoculated offspring, and of the mice kept through successive generations on the diet of ten ingredients, diet C (200), with high survival of inoculated offspring, is shown in Table 2.

Our earlier publications were based on inoculations up to number 125. Continuation of our observations has led us to recognize the possibility of greater importance in the genetic background and less in the ancestral diet than we inferred at the time of these publications. We call attention to the following examples:

In the small group of inoculated descendents of mouse 1 there is no significant difference whether the last ancestral diet was diet C or diet B. At the bottom of the tabulation of descendents of mouse 2 it will be noted that more than 50 weeks of maintenance of mothers, or even also of grandmothers, on diet C, induced no improvement in the survival of the offspring. Conversely, at the bottom of the tabulation of descendents of mice 3 and 4, it will be seen that maintenance through one or two generations on diet B did not reduce the survival percentage of the offspring.

TABLE 2

Genealogy, Ancestral Diet and Survival of Offspring after Inoculation

1	2	3	4	5	6
Genealogy of Mother	*Ancestral Diet*	*Weeks on Last Diet ±1 Week*	*Inoc. Exp. No.*	*No. Inoc.*	*No. Surv.*
102	ACDC.C	51	110	2	1
1022	"	75	116	3	1
10223	"	107	121	2	1
				7	3
141	ACDC.B	7	110	1	1
141	"	15	112	2	0
141	"	31	116	2	1
1411	ACDCB.B	30	116	4	0
1411	"	39	118	3	0
				12	2
23	ACB.B	80	110	6	0
23	"	88	112	5	1
23	"	104	116	6	1
23	"	112	118	10	0
233	"	104	116	8	0
2331	"	152	125	4	1
2331+	"	205	134	11	0
2331++	"	209	135	21	5
2331++	"	221	137	25	0
231	"	113	118	7	0
231	"	129	119	41	5
231+	"	136	121	20	2
231+	"	144	123	20	0
231+	"	152	125	16	1
				200	16
231	ACB.C	7	127	17	1
2317	ACBC.C	51	134	2	0
23173	"	67	137	7	0
				26	1
3213	ACDEC.C	59	112	8	3
321++	"	68	116	11	3
321+++	"	83	118	13	9
321+++	"	99	119	20	3
32113+	"	107	121	11	2
3211+++	"	135	129	10	9
32113++++	"	163	131	16	7
32113++++	"	171	133	10	5
321133144	"	179	135	9	5
32113++++	"	179	136	9	4
				117	50

1	2	3	4	5	6
Genealogy of Mother	*Ancestral Diet*	*Weeks on Last Diet ±1 Week*	*Inoc. Exp. No.*	*No. Inoc.*	*No. Surv.*
321111	ACDEC.B	15	129	8	6
32113312	"	7	129	6	3
32113312+	"	40	132	14	6
321133122	"	47	134	13	8
321133124	"	51	135	5	2
				46	25
41	ACBC.B	7	110	6	1
43	ACBC.C	20	110	6	4
43	"	28	112	5	1
43	"	44	116	6	3
43	"	52	118	7	4
4311	"	40	125	8	5
431+	"	104	129	13	10
4312+	"	144	134	15	4
43121	"	162	137	6	2
431221	"	150	136	3	2
433	"	76	121	7	4
433	"	84	123	11	5
433	"	92	125	12	6
4331+	"	144	134	14	11
43316	"	161	137	12	12
				131	74
4333	ACBC.B	7	127	15	8
43311	"	7	132	12	11
43311	"	8	134	7	6
4333+	ACBCB.B	55	135	7	6
				41	31

Column 1 — describes the ancestry of the offspring for inoculation. Each digit, beginning at the left of the number, identifies the mother of the succeeding generation. An identical succession of digits therefore indicates identical ancestry up to that point. A + sign indicates that descendents from two or more sisters are combined in the offspring inoculated.

Column 2 — the letters to the left of the period indicate the consecutive diet changes in the ancestry of the mother; the letters to the right of the period indicate the maternal diet prior to the weaning of the mice which were subsequently inoculated.

Column 3 — indicates the number of weeks the last diet was in effect in the ancestral history of the inoculated mice.

In view of these facts, we are forced to conclude that it should be considered as yet an open question as to whether the striking difference we reported [1, 2, 3] in the susceptibility to inoculation with *Salmonella enteritidis* in mice whose ancestors had been kept on diet C (200) or diet B (221) respectively, was necessarily the result of the dietary factor, or whether some

genetic difference may have existed perchance between the original ancestors 1, 2, 3, 4, a difference preserved through successive generations by the practice of sibling mating.

Continuation of this study by one of us (C. F.) is directed toward testing these alternative hypotheses by substituting crossed mating for sibling mating. Crossed mating will tend to distribute the genetic characteristics evenly among the groups of mice used to study the maternal diets with respect to their effect on the disease resistance of their progeny. To this end, a single litter composed of 3 males and 3 females, whose older brothers and sisters had shown approximately 50 per cent survival when inoculated with *Salmonella enteritidis*, has been selected as the parent generation for the new set-up. The female progeny of each litter which are to be used as breeders in the succeeding generations will be divided so that part of them are kept on their ancestral diet B (221) and part are changed to diet C (200). Females kept through successive generations on one diet will be mated with brothers of females kept through successive generations on the other diet, and vice versa. Any genetic differences between the two groups should thus be progressively equalized, yet the long continued influence of the same diet operating through the females of successive generations by way of pregnancy and lactation should be demonstrable.

SUMMARY

The importance of the genetic factor in influencing the survival of mice following inoculation with *Salmonella enteritidis* is reaffirmed. The importance of the maternal diet, on the other hand, is still an open question which requires further study with a different genetic technic from that which we have thus far recorded.

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Civil Service in Public Health*

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A PERSON is most commonly asked to speak at a public meeting for the reason that he is an authority on some subject. I wish that I had the distinction of authority, but I have not.

My appearance here is due to my having been actively exposed to the intricacies of merit systems of personnel administration. My special assignments as a professional health worker have happened to lead me into most of the formal and many of the informal discussions of the merit system for health workers in Washington.

The administrative aspects of personnel management should of course be discussed by those familiar with the technics involved and must, in all cases, be examined by the light of local laws, administrative practices, and concepts of government. These few remarks are not addressed to the administrators of the several departments as such but rather to the individual health worker. I shall try to shape my remarks around what the merit system will mean to him and what he should do about it.

For the purposes of this paper, the terms "civil service," "merit system," and "career service" will be used interchangeably. They will denote a system of personnel management in official health departments under which the selection of personnel and related matters are based on considerations of merit and are determined by objective procedures. While the terms are subject to technical differentiation, it will not be done at this time.

Last year an amendment made to certain titles of the Federal Social Security Act focused the interest of all workers in official health agencies upon merit systems of personnel administration. The amendment as applied to Title V provided that after January 1, 1940, state and local plans for maternal and child health and for crippled children services must include methods relating to the establishment and maintenance of merit systems of personnel administration.

Following a conference with the State and Territorial Health Officers, the U. S. Public Health Service broadened its Regulations Governing Allotments and Payments to States under Title VI of the Social Security Act so as to incorporate provisions with respect to a merit system. The regulations now provide that in order to be eligible to receive funds under Title VI of the Social Security Act, states must submit to the Surgeon General any merit system plan developed to cover any part of the health personnel. Any such plan for a merit system found acceptable shall apply to all personnel engaged in the federal state coöperative health program.

Inasmuch as many health departments receive some federal grants-in-aid

* Read before the Western Branch American Public Health Association at the Eleventh Annual Meeting in Denver, Colo., June 27, 1940.

funds, the provisions in respect to merit systems attached to these funds affect a high proportion of state and local health workers. Their interest in the whole scheme should therefore be assured.

Many persons think of civil service or a merit system as a procedure designed only to prevent the selection of personnel on the basis of political considerations. They think the only reason for the existence of civil service is to circumvent consequences implied by the expression "to the victor belong the spoils."

A merit system should accomplish this purpose; but to be successful, it must go still further. It must of course eliminate from the selection process all types of politics, whether partisan, personal, fraternal, racial, religious, professional, labor, or school. At the same time it must provide that qualified persons are selected for positions and that the eligibility lists are made up of the best qualified.

If it were necessary only to obtain qualified personnel, without regard to the degree of qualification, the most economical and impartial procedure could be a simple one based on the laws of probability; in other words, a random selection from those having the required minimum qualifications. A lottery might do, or a bingo game, or some modification of the numbers racket.

Some opposition has been expressed to the formalization of the selection process by the adoption of standards, rules, and regulations. Well intentioned critics say in effect that on the whole health personnel have been selected on the basis of merit for many years; that politics has not played a large part in the choice of health workers—at least for the more responsible, professional positions; and, because of this, that the adoption of standardized procedures is both unnecessary and uneconomical.

If all health departments were relatively free of partisan politics, and if merit systems had no purposes other than the selection of the best qualified, that objection might be valid. But those premises are not necessarily true. Unfortunately, some health personnel are still selected almost entirely on the basis of political connections, and, as a result, the quality of health work done is often poor. The adoption of a sound merit system will do much to obviate such conditions.

Also, the use of merit systems has several beneficial results other than the selection of the best qualified to serve in governmental agencies. One of the most important of these is that such a system will gain public recognition because of the high professional standards attained. Fortunately, we in health work have developed staffs better trained and qualified for their jobs than are the staffs of many other branches of government. Public acceptance of our leadership, and confidence in our work can still be greatly enhanced when these high professional standards are more widely recognized. This should result in salaries more in keeping with the requirements of the job than is the case at present. I am sure all of us favor such a result.

Still another circumstance which may be expected from the adoption and proper administration of a sound merit system is greater security and longer tenure of office than are offered at present to those individuals who are performing their work in a satisfactory manner. Such a result is important to all professional public health workers. It is unreasonable to expect even the most competent individual to perform satisfactorily when his likelihood of continued employment hangs by the thin thread of personal favor; this, as most of you know, may be severed at a moment's notice.

By no means do I intend to imply that a merit system should make a

sinecure of each position in the health department. Nothing could be worse than a system of personnel management which would prevent the dismissal of employees for misconduct or gross incompetence. But the merit systems now being developed can, and with your help will, prevent the dismissal of a competent employee solely because he has earned the personal animosity of someone in a supervisory capacity.

My last topic is the provision of opportunity for professional growth and for promotion or demotion, as the case may warrant, on the basis of performance. Herein lies the greatest opportunity for improving personnel relationships and the quality of work performed in public health departments.

Despite the fact that the performance of health departments in general is excellent with regard to selection of personnel, their records in assurance for professional growth and maintenance of status for competent workers have been rather poor. The opportunity now exists for developing a real career service for health workers. With proper administration of soundly conceived merit systems, it should no longer be necessary for the health worker to look forward to a life of insecure employment, and often without promotion.

Four general statements with regard to merit systems should be made in closing:

First, whether or not one favors the extension of civil service into all health departments, it is actually taking place and it is of personal consequence to each health worker.

Second, since every health worker practically is involved, it should follow that health workers will interest themselves in the plans for their jurisdictions—those now in effect or those being developed.

Third, the approval of a state merit system plan by a federal agency constitutes no continuing guarantee that it will be satisfactory in operation to either the state administrator or the individual worker covered by the plan.

Fourth, the success of a merit system will depend to a great extent on the recognition that personnel management is a specialty in public administration, and on the assignment of this duty to individuals properly qualified for it by experience or training.

Industrial Nursing*

Supplementary Report of the Study Committee on Industrial Nursing on Five Small Industries in Philadelphia County

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THIS report, which forms a brief supplement to the admirable and stimulating survey reported by Miss Stevens,[1] is concerned with the nursing service in five small plants in Philadelphia. While much of the lack of uniformity which has been presented to you exists here also, some is obviated by the fact that one physician serves 4 of the 5 plants, and one nursing agency—the Visiting Nurse Society—supplies all the nursing service. The variables are found in the number of employees per hour of medical and nursing time; the accident load in terms of plant activity and population; and the attitude of management toward health promotional as well as corrective services.

To follow the development of the main report, I can begin by saying the general policies of nursing practice in these plants were first set by the original sponsoring agency, the Philadelphia Health Council and Tuberculosis Association, in 1926. When the Visiting Nurse Society assumed responsibility for the nursing program in these plants in 1932, certain things were already established. The nurse, paid on an hourly basis, was employed 2 hours per week per 100 employees. The program provided for assistance of the physician in annual physical examination of all employees, care and follow-up in the plant of accidents and illnesses, and the promotion of employee health by very general health supervision and individual instruction. Individual records were kept.

The plants now range in size from 100 to 570 employees. All but one, a lithographing company, are food preparation plants. The employees in these plants total approximately 1,600 and are scheduled to receive 50 hours of nursing service weekly. Three hours is the smallest amount given any plant in a week, but this is not the plant having the lowest number of employees. However, the largest plant does have the greatest amount of service—23 hours. Long ago it became clear that the accident rate in a plant was influenced by the kind of activity. Therefore, the old standard of 2 hours of nursing per week for each 100 workers has been relinquished and time is now purchased on demonstrated need.

In all 5 plants the nurse has responsibility with the physician for plant inspection and individual health instruction. There are no classes. A planned use of posters in strategic spots represents the chief effort at group health education. In no plant is the nurse a member of the Safety Committee.

None of the programs provide for nursing service in the home, but the use

* Read before the Public Health Nursing Section of the American Public Health Association at the Sixty-eighth Annual Meeting in Pittsburgh, Pa., October 18, 1939.

of the Visiting Nurse Society by the plant physicians and nurses is showing a steady increase. At the time that the society embarked upon this piece of work, each of the 5 plants had a satisfactory relationship with at least one neighboring hospital for referral of emergency accidents or illnesses. These resources are used constantly. More recently the use of local health and social resources by these plants has increased appreciably, and the plant physicians give credit to the nurses for this activity. It is natural for a public health nurse familiar with her community to use its resources for industrial patients as she would for others. The tendency to work as an isolated unit mentioned in the main report was very apparent in the industries in question 7 years ago.

The programs for employees vary greatly within the plants. Two now follow the policy of preëmployment physical examinations. In one of these the examination includes a Wassermann test. In the remaining 3 plants examinations take place as soon as possible following employment. In all the plants blood tests are made upon request, and, when necessary, treatment is arranged through the private physician or a hospital clinic. In 2 plants the health promotion program has included the voluntary use of cold vaccine for susceptible employees. Two plants have loan funds, established by management, to facilitate correction of defects.

The nursing procedures have been reasonably well standardized. Such variations as occur are present because of local needs. Each plant has written standing medical orders, nursing policies, and procedures. These have been worked out jointly by the group involved.

The qualifications of the nurses are those for staff appointment to the Visiting Nurse Society plus successful experience within the society. Early in its participation in industrial work, the society became convinced that a supervisor acting as a liaison person between the industry, the medical director, and the nursing agency, was imperative. For the past 5 years an assistant supervisor has carried this responsibility, introducing new staff members to the plant, providing for continuous education of the industrial nurses, and working out the problems of an experimental program. To her effort is due much of the standardization suggested above.

The Visiting Nurse Society is a member of the National Safety Council and uses its material constantly. Attendance at national meetings in this field has also become an organization policy.

In conclusion, we agree thoroughly with the committee report concerning the problems confronting nursing in industry. We are equally in accord with the opinion that industry is ready for nursing activity. Our experience leads us to believe that industry and industrial physicians are desirous of good nursing service for their workers. It is our conviction that the public health nurse can be a valuable person in the small plant, and can carry such activity in conjunction with her district work successfully. Since the public health nurse on an agency staff is primarily a part-time worker, she cannot of course fill the need of the plant which requires full-time service.

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HANS ZINSSER, M.D.

THE death of Dr. Hans Zinsser on September 4, brought to a close the activities of a man who won for himself an enviable position in the medical profession, and particularly in that branch of which he had made a specialty—Bacteriology. Dr. Zinsser was born in New York City in 1878, of German parentage. He was educated in the schools of that city, took his A.B. degree from Columbia University in 1899, and his medical degree from the College of Physicians and Surgeons (Columbia University) in 1903. His internship was taken at the Roosevelt Hospital in 1903–1905. He was Assistant Bacteriologist at his Alma Mater in 1905 and 1906, and Instructor in Bacteriology and Hygiene from 1907 to 1910. In 1910 he became Associate Professor of Bacteriology at Stanford University, and Professor at the same institution from 1911 to 1913, when he returned to Columbia University as Professor of Bacteriology, where he served for 10 years. In 1923 he became Professor of Bacteriology and Immunology at Harvard Medical School, which position he held at the time of his death.

He was active in many lines, but always seemed particularly interested in the question of immunity. The World War of 1914–1917 stirred him mightily—as he says, partly from temperament and partly through the hope that a defeated Germany might be transformed into the free republican state for which many Germans of his stock had hoped. His opportunity came when he was appointed on the American Red Cross Typhus Commission to Serbia, in 1915, which was "his first experience of mass misery." It had a further effect, however, of arousing his interest in this dread disease, an interest which never flagged, so much so that his last scientific work, announced in January, 1940, was devoted to the development of a vaccine for the mass protection of people against the European type of the disease, on which he had worked for a number of years.

In 1917, when America entered the War, Dr. Zinsser was appointed Major in the Medical Corps of the U. S. Army, and was finally promoted to the rank of Colonel. He served as Sanitary Inspector of the First Army Corps, and the Second Field Army of the A.E.F., also Assistant Director of Laboratories and Infectious Diseases for the A.E.F. In the summer of 1923, he went to Soviet

Russia as Sanitary Commissioner for the Health Section of the League of Nations. In 1935, he served as exchange professor in Paris, and, in 1938, at the Peiping Union Medical College. It will be seen that he traveled widely, and under circumstances which gave him more than usual access to the real conditions existing and to the character of the people whom he was serving. His work brought to him many honors, among which were the D.S.M. from the United States, the French Legion of Honor, and the Serbian Order of St. Sava. He became President of the New York Pathological Society in 1915, and of the Association of Immunologists in 1919. He was a member of many scientific bodies, among which may be mentioned the National Academy of Sciences, American Philosophical Society, American Association for the Advancement of Science, American Academy of Arts and Sciences, Harvey Society, Society for Experimental Biology and Medicine, Association of Pathologists and Bacteriologists, Society of American Bacteriologists, American Cancer Society, American Association of Experimental Pathology, Association of American Physicians, and the National Research Council. He was elected a member of the American Public Health Association in 1920, and a Fellow in 1934. At the time of his death he was a member of the Governing Council.

The honorary degree of Doctor of Science was awarded to him by Columbia University, Western Reserve, Lehigh, Yale, and Harvard. Dr. Zinsser early in his career began to write and produced a *Textbook of Bacteriology* in 1911, which was well received, followed by *Infection and Resistance*, and *Resistance to Infectious Diseases*. He later entered the field of lay writing and in 1935, *Rats, Lice, and History* appeared, which was classed among the best sellers, followed in 1940 by *As I Remember Him: The Biography of R. S.*, which was the story of his own life and observations with " digressions," chapters of which had appeared in the *Atlantic Monthly* under the title, " More Truth Than Poetry." For more than two years he had known he was suffering from an incurable disease. He spent that time in trying to perfect a method for the mass production of his vaccine against the European type of typhus and in writing his autobiography as the biography of a third person—a friend whom he had known well, " without whose constant coöperation and criticism " it could not have been done.

" Much has been made, and should be made, of the gay and wistful courage with which he faced the knowledge that he would surely die," and his philisophy and courage under the circumstances must have a powerful and comforting effect on all readers who should find themselves under similar circumstances.

Requiescat in pace.

RAW GARBAGE AND TRICHINOSIS

THE continued prevalence of trichinosis, as well as one of the principal methods by which it is spread to human beings, has been called to the attention of our readers from time to time, especially in two notable contributions.[1, 2] Indeed late investigations tend to show that the disease is even more prevalent than has been believed.[3]

A recent survey,[4] the results of which have emphasized the facts heretofore brought forward, embraced 764 cities of 10,000 inhabitants or over, and showed, according to the reports from their health officers, that 403, or 52.7 per cent, disposed of their garbage in whole or in part by feeding it to swine, mostly in the

raw state, only 24 of them cooking it before consumption, and some of these cooking only a portion. Twenty-two of these cities maintained hog farms for the purpose of disposing of garbage, either to derive revenue therefrom or to avoid the expense of disposal. While no reliable statistics are available, there is reason to believe that smaller communities employ this method of garbage disposal even more frequently than the larger cities.

It seems that our American cities are, directly or indirectly, the largest feeders of raw garbage to swine, and Wright says that, contrary to the general opinion, hogs fed on uncooked garbage are probably the major source of human trichinosis rather than rats. A feature that to a great extent conceals the evil of this practice is that many hogs which have been fed on raw garbage are slaughtered locally, and there seems to be a distinct purpose on the part of garbage feeders to avoid marketing in federally inspected packing plants due to the desire to escape the losses of condemnation under federal inspection.

The distribution of raw garbage feeding is important and interesting. In New England, of 141 cities, 85.2 per cent fed garbage. Next came the Mountain and Pacific States, in which respectively 78.9 and 82.8 per cent disposed of their garbage in this way.

The areas in which the most hogs are fed garbage are those in which the largest number of cases of trichinosis are found. The Pacific Coast States, in which 82.8 per cent of the cities dispose of garbage by feeding, have the highest morbidity rate of any section. The New England States, which come next, lead all other geographical areas in the number of cities disposing of garbage by feeding to hogs. It does not seem to require much argument to convince one that there is a distinct relation between the amount of trichinosis in human beings and the extent of feeding raw garbage to hogs in the communities in which the disease is prevalent.

None of these fundamental facts are new. This *Journal* has repeatedly called attention to the risks of feeding raw garbage to hogs. Many of the cities which indulge in this bad practice have adequate food inspection, good milk ordinances, pure water supplies and satisfactory sewerage systems. In other words, these municipalities have provided protection against most of the diseases spread through food and drink, but have failed to guard their citizens against trichinosis. Indeed we might say that they are fostering the disease.

The reasons for this situation are apparently almost entirely commercial. Some cities are themselves directly to blame since they maintain hog farms of their own. In others pressure has been brought to bear against the passage of ordinances designed to protect the citizens against the menace of raw garbage fed pork. In at least two states legislation to control the feeding of raw garbage to swine has been blocked by organizations of those engaged in the business. If, as Wright holds and we believe, the hog is the chief source of human trichinosis, little can be accomplished in the way of control until cities and towns refuse to dispose of their garbage in this unsanitary and disease-spreading fashion.

Here is the job for health officers.

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3. Andes, Jerome E., Greene, Robert A., and Breazeale, B. S. A. *J.A.M.A.*, June 8, 1940, p. 2271.
4. Wright, Willard H. *Pub. Health Rep.*, June 14, 1940.

TULAREMIA

TULAREMIA, known also as "rabbit fever" is not only being more often recognized than formerly, but appears to be actually increasing in prevalence. Described first in 1910, by McCoy, of the Public Health Service, while working on plague in California, as a "plague-like" disease among ground squirrels in Tulare County, it was subsequently intensively studied by Edward Francis of the same Service, who showed its identity with the "deer fly fever" of Utah, and gave the name "tularemia."

In 1939, 2,200 cases were reported, with probably 150 deaths. It has been observed in all of our 48 states and in the District of Columbia, and since 1925 it has been recognized in 10 foreign countries.[1]

Over 90 per cent of the human cases in this country are caused by direct infection in handling wild rabbits and hares, hence we find the disease particularly prevalent in market men, hunters, housewives, and those who dress rabbits for the market. However, human cases have arisen through infection from 24 forms of American wild life, including horseflies, wood ticks, dog ticks, insects, tree squirrels, opossums, ground hogs, muskrats, skunks, and very rarely a few others. However, the wild rabbit of the country is the main source of the disease, which is usually acquired by handling the carcasses, but in 20 cases from eating the animal insufficiently cooked. Among these 20 cases, there were 12 fatalities.

Another report [2] told of the discovery of the *Bacterium tularense* in the water of three streams in Montana, which indicates another possible source of infection, and this confirms an observation reported from Russia in 1935 of an epidemic of 43 cases due to drinking the water from a brook believed to have been contaminated by water rats. The discovery of the *Bacterium tularense* in water in Montana was incidental to an investigation of epizoötic tularemia in beavers.

From what has been said, it is evident that prevention consists largely in protecting the hands and the body when dressing wild game, especially rabbits. Francis long ago warned hunters particularly against handling a rabbit that was not active and lively, especially one that could be killed with a stick, as such rabbits are apt to be infected. Those whose work requires handling of rabbits should wear rubber gloves, but it is better still for those who are not immune to avoid such employment, since one attack protects against subsequent infection. Careful washing with soap and water, followed by disinfection, is recommended, after handling infected flesh as well as after touching the fur of wild rabbits or other game, especially when killed in regions known to be infested. Thorough cooking makes infected meat safe. Refrigeration does not kill the organism, unless prolonged.

In spite of some claims to the contrary, there is no specific preventive or curative treatment for the disease. Convalescence is slow. Weakness and disability may persist for 2 to 3 months. The mortality is about 5 per cent, mostly from the supervention of pneumonia.

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Credit Lines

A Digest of Diversified Health Interests

D. B. Armstrong, M.D., and John Lentz, M.S.

In behalf of the good neighbor policy

The need for a comprehensive manual covering all important aspects of hospital administration in this country has frequently been voiced by Latin-American physicians and health authorities. Thus it comes as good news to learn that *The Modern Hospital*, a journal published primarily for hospital administrators, has published a reference book designed wholly for use in the Central and South American countries. This book is written in Spanish and bears the title "El Libro del Hospital Moderno" (The Book of the Modern Hospital). Latin-American hospitals, clinics, medical schools, and health agencies will receive the book free of charge. We view this as a most laudable undertaking that may help to strengthen the ties of Pan-Americanism.

The book contains 34 articles prepared by recognized physicians and hospital authorities. These articles summarize a large body of material on hospital practices in this country. There are sections on hospital philosophy, planning and construction, administration, clinical services, and international coöperation. The text is supplemented by helpful illustrations and floor plans.

We applaud the publication of this manual. It arouses in us hope that the public health profession will also soon demonstrate that it is alert to the need for the development of closer relations within this hemisphere. The American Medical Association has already taken a step in this direction by inviting Latin-American physicians to their 1941 convention. It is our belief that an exchange of cultural and scientific material will be an important factor in bringing the Americas closer together.

Coming attractions

Seldom has the roster of forthcoming health motion pictures been so extensive. Among the agencies announcing new films is the Metropolitan Life Insurance Company which, with the coöperation of the U. S. Public Health Service, is preparing a one reel production on a subject that is of interest to all health and welfare agencies—nutrition. The film will be made by Paramount Pictures and will be designed primarily for theatrical exhibition. Of especial interest is the fact that this film will be photographed in Technicolor. No release date has been set, but the film will probably be ready for showing early in December. By means of a series of dramatic episodes, the film will show the vital rôle that proper nutrition plays in maintaining health. Sequences dealing with physical examinations and laboratory experimentation will dramatize important facts about nutrition, while other episodes of the film will stress the importance of knowing certain facts about essential foods and how to buy them economically in America—"a land of plenty where an abundant supply of food is available to maintain the growth, health, and vitality of every citizen."

The Visiting Nurse Service of the Henry Street Settlement in New York

City will release during October a picture called "Day After Day." Its theme will center around the relationship that exists between the nurses of the Service and their patients. Four types of cases will be dealt with in the story: the surgical case, the general case, the maternity case, and the crisis case (pneumonia). The film will be used in the Service's forthcoming drive to raise funds. Both 35 mm. and 16 mm. prints will probably be available.

The American Social Hygiene Association is considering the production of a film on gonorrhea. Health departments and other agencies have been circularized to determine whether or not a film on this subject is needed. Replies received indicate that a picture on this subject will be welcomed and production will no doubt go forward in the near future.

Of interest to health agencies is an announcement from England that plans are being worked out for the production of a feature picture covering the history of the International Red Cross. Leading screen artists, technicians, and other film workers will be asked to donate their services in this undertaking. Proceeds from the film will be given to the Red Cross, with whose approval and coöperation the film would be made. The proposed production would not be a propaganda or documentary feature, but a dramatic presentation centering around the life of Henri Dunant, the Swiss banker who contributed so much to the establishment of the Red Cross.

"Twixt the Cup and the Lip" is the title of the latest film produced by the New York State Department of Health. This picture was made primarily for the purpose of promoting higher standards of restaurant sanitation. Methods employed in washing and sterilizing dishes and eating utensils are shown. The film is available in two reel form and distribution is limited to health officers in New York State for showing to restaurant operators, food handlers, and agencies interested in restaurant sanitation. A one reel version of this picture may be released at a later time for theater use.

SEEING SNEEZES

We ordinarily have a deep-seated aversion to writing anything on the subject of sneezes simply because our sneezes have a habit of coming on at times calculated to cause us no end of embarrassment. In the theater, for example, we seem to have a tendency to sneeze just at the time when the star is delivering the most important lines of the play. Thus we become the subject of a thousand scowling glances. Or again we are apt to sneeze in the midst of some dignified ceremony only to receive the frigid stares of everyone present.

But, be that as it may, we do welcome the opportunity to comment upon the photograph of a sneeze which was recently released by the Department of Biology and Public Health of the Massachusetts Institute of Technology. This photograph is perhaps already well known to public health departments throughout the country as it has been reproduced in newspapers, magazines, and other periodicals.

"Credit Lines" consulted C. E. Turner, Dr.P.H., regarding the photograph. We learned that the picture was taken by the technic of ultra-high speed photography, which substitutes an instantaneous flash of light for the opening and closing of the camera shutter. This stroboscopic light illuminates the object to be photographed with an intense flash of short duration estimated at 1/30,000 of a second. Thus the droplets expelled by sneezing are photographed before they have scattered or evaporated. The photograph reveals that thousands of droplets are expelled in which large numbers of bacteria are later found to be present. The so-called

"muzzle velocity" at which the droplets travel may be as great as 150 feet a second, though the majority do not travel more than 2 or 3 feet.

Health educators have long sounded warnings about the unstifled sneeze or cough. But their warnings have for the most part gone unheeded. Thus the actual photograph of a sneeze which makes visible the dangers of droplet infection should be a "natural" for poster use and other publicity purposes. Health and welfare agencies may reproduce the photograph. Inquiries concerning its use should be sent to the Department of Biology and Public Health of the Massachusetts Institute of Technology, Cambridge, Mass.

Dr. Turner is to present a paper at the Detroit Meeting in which the use of the new photographic apparatus and its possible application in the field of public health and health education will be described.

Stroboscopic light, the essential device needed to make pictures similar to the sneeze photograph, will be placed on the market soon by the Eastman Kodak Company. It will be known as the Kodatron Speed Lamp.

WHO WILL WIN?

"Round one" in a lively controversy over the relative merits of the older epidemiological case finding methods in tuberculosis, including primarily the examination of family contacts, in contrast to the more recently developed mass tuberculin testing and x-ray program, was staged at the last meeting of the National Tuberculosis Association in Cleveland. The heavy-weight contenders in this controversy were Edward S. Godfrey, Jr., M.D., and J. Arthur Myers, M.D., with Allen W. Freeman, M.D., as "third man in the ring."

Dr. Godfrey led off by stating that he condemned the promiscuous tuberculin testing of school children as a waste of time, money, and effort, at least until the real job is done. The real job, maintained Dr. Godfrey, was that of finding and isolating cases of tuberculosis among families in which a known case is or has been present. He added that special emphasis should be devoted to securing the medical examination—including x-ray—of the adult members of such households.

Dr. Myers countered with a statement in which he conceded that a method that should be emphasized is the search for cases among family contacts, but that mass tuberculin testing should be extensively used for the finding of cases in those states and cities in which both the death and case rate from tuberculosis have been very substantially reduced.

Dr. Freeman balanced the arguments by stating that a year or two ago he would have upheld Dr. Godfrey's contention, yet he had recently had several students in his courses at Johns Hopkins who convinced him that there is substantial value also in mass tuberculin testing. Dr. Freeman felt that both Dr. Godfrey and Dr. Myers were right. He advocated considerable concentration of effort on the discovery of tuberculosis among family contacts in states and cities where the death rate is high or fairly high, and a judicious use of both measures in states and cities where the rates are low or fairly low.

If tuberculosis is to be wiped out in the next two decades, it will be the outstanding event of our times in public health. Consequently, ringside seats will be at a premium if and when Drs. Godfrey and Myers engage in the second round in this "battle of the century."

THE ANSWER IS YES

Has our health education campaign succeeded? Has our message impressed the public? These and similar questions always arise when health educa-

tors begin to take stock of their efforts. Everything from Gallup polls to quizzes have been used to answer these questions, but we know of no instances in which such a clear-cut answer has been obtained as that cited by Clarence C. Little, Sc.D., of the American Society for the Control of Cancer.

Dr. Little's statement, which appeared in the Society's *National Bulletin* under the title "As Goes Maine . . . ," follows:

"The problem of obtaining data concerning the value of cancer education is a difficult one. There are so many elements, both of subject matter and of personnel that enter into the process of educating the public on cancer that it is difficult to obtain information concerning the success of the Society's campaign. For that reason data obtained by the Tumor Clinic in the Maine General Hospital at Portland are of particular interest.

"In order to evaluate it properly it will be well to remember first, that Maine has made the best record of any state in establishing and supporting the Women's Field Army; and second, that it is a conservative state in which change is the exception and established order the rule.

"The number of total new patients coming to the Tumor Clinic at the Maine General Hospital in Portland were for successive years ending March 31 as follows: 1935, 93; 1936, 79; and 1937, 88.

"At this point the first campaign of the Women's Field Army had been completed and the movement was gaining strength. Let us see what the following three years show—1938, 185; 1939, 229; and 1940, 287.

"There is no need for complicated statistical interpretation of these figures. They tell an impressive and encouraging story. They indicate what we may expect to find all over the country as the work progresses.

"It is this sort of result that in times of doubtful values and shifting ideals stands out as a beacon to guide and revitalize those who are giving their efforts to save lives from cancer. As the results accumulate we shall find that the slogan Fight Cancer with Knowledge, is no empty phrase."

ADVANCES IN DENTAL EDUCATION

In the autumn of 1941, Harvard University will inaugurate a new plan of dental education made possible by contributions from several philanthropic foundations. Under the new plan, the present Harvard Dental School will be re-named the Harvard School of Dental Medicine. The course of study will be extended from 4 to 5 years and will combine in increased measure the basic knowledge and skills of both medicine and dentistry.

Dental students will register in both the School of Dental Medicine and in the Harvard Medical School, taking 3½ years of the same medical courses required of students in the medical school, and in addition 1½ years of specific dental training. Dental graduates will be granted both the M.D. and D.M.D. degrees.

It is announced that admissions to the School of Dental Medicine will be governed by the same standards and the same committee which govern admissions to the Harvard Medical School.

OF ANCIENT VINTAGE

Health education is generally regarded as having had a comparatively recent origin. Hence it may be surprising to learn that as long ago as 1781 the Massachusetts Medical Society gave as one of its primary purposes the diffusion of medical knowledge. In 1846, the first president of New York Academy of Medicine included the enlightenment of the public mind "on the subject of medicine and its collateral branches of science" among the

Academy's objectives. Later, in 1902, Dr. Andrew H. Smith, in an address to the New York Academy of Medicine, made some observations which show that health education was beginning to receive serious consideration. Dr. Smith's remarks are worth quoting because his views are as valid today as they were in 1902:

> The world has a right to know and it is our duty to tell, just what progress we are making . . . , the steps by which results are obtained, the difficulties we meet with, the uncertainties which are still to be cleared up, the problems which are pressing for solution. Inability to make these things known is the explanation of the failure of scientific medicine to obtain that hold upon popular recognition and respect which it obviously deserves, while the most impudent and absurd parodies upon it are eagerly accepted by a public which is credulous in this respect only because in this respect it is ignorant.

A HEALTH OFFICER THINKS IT OVER

An item in a recent issue of the *Bulletin* of the North Carolina State Board of Health reveals, we think, certain reactions which many health officers must experience as various cases and situations are weighed and reviewed. Items of this sort are rare—hence we quote Dr. John W. Williams, Health Officer of Martin County, N. C.:

"A local physician was called in the country to a fifteen year old unmarried Negro girl. He found her having eclamptic fits due to pregnancy. She was carried to a hospital, labor was induced, a live baby was born and the girl died. Ways to view it.

"*Materialism*—That Negro girl was trying to carry an illegitimate baby to birth. Her kidneys could not take care of the extra burden, so she died.

"1. The county has the expense of transportation, hospitalization, physician's fee (perhaps), and burial, besides the tax of keeping a health department to prevent this type of case.

"2. There will be a Negro orphan baby to starve or exist—without even an ignorant Negro mother's care.

"3. The county and state have one more unit to add to their maternal mortality percentage.

"4. A farm hand capable of producing a crop of beans, as well as babies, died in her best productive age for each.

"*Christianity*—But would it not be best to look at it from just the humane side—forgetting color, intellect or creed, and say—'It's a damnable shame on all of us that some one of us did not help her to one of our weekly prenatal clinics and save her?'"

MAGAZINE ARTICLES

Current popular magazine articles on health or of medical import:

"The Vitamin Way to Health." Maxine Davis. *Cosmopolitan Magazine.* September, 1940.
"They Need Not Die." J. D. Ratcliff. *McCall's Magazine.* September, 1940.
"Mad Dogs." A. Williams. *Good Housekeeping.* August, 1940.
"Tropic Killer." J. D. Ratcliff. *Colliers.* August 10, 1940.
"If It's Chicken Pox." Hope Satterthwaite. *Parent's Magazine.* September, 1940.
"Highlights About Vitamins." Victor Heiser, M.D. *Better Homes and Gardens.* August, 1940.
"Safety on the Screen." E. I. Woodbury. *Business Screen.* Number 7.
"Cotton Field Clinic." J. D. Ratcliff. *Survey-Graphic.* September, 1940.

(The above is not presented as a complete list and the articles cited are not necessarily recommended.)

Hints and Hunches

Good copy—Tips on how to write good copy according to a *Time Magazine* advertisement:

> Journalism in the U.S.A. pours out millions of words each week; *Time's* limit is some thirty thousand. And when every word must do the work of a dozen, it needs to be a better word, and more economically joined to its fellows. Nouns must paint landscapes, adjectives must do portraits, verbs must shoot straight.

Health educators might try to follow *Time's* formula, especially in connection with the wording of health slogans in which success or failure depends upon phrasing that "shoots straight."

Physicians as authors—Hardly a week passes without the announcement of a new book from the pen of a physician. In fact the list of books written by doctors has so increased that one is inclined to think that perhaps authorship and the practice of medicine are allied arts. It has been suggested that this literary trend may eventually lead some of the progressive medical schools to set up courses in fiction to teach potential physicians how to make novels out of nutrition and touching tales out of ticks and tonsils!

Health of the CCC—Young men enrolled in the Civilian Conservation Corps have shown marked improvement in health. According to a recent report, 25 per cent of the young men who sought enrollment were substandard in weight. It was necessary to waive weight requirements in order to fill quotas. Another 45 per cent were below standard weight at the time of acceptance. After 6 months of CCC training, an average gain in weight of 8.16 pounds was noted.

Conferences—"Staff conference tomorrow at 10 A.M." This familiar item can frequently be found on the bulletin boards of all health departments as the conference method of planning activities or programs has become an established procedure. *Printer's Ink Monthly* for June, 1940, carries some thought-provoking comments on the subject of conferences that are well worth remembering.

The publication states that the following quotation should be hung in every conference room: "They think that winning an argument is what matters, not learning the truth." Elaborating upon this, *Printer's Ink* adds:

> A great many conferences resolve themselves into clashes of will when they should be exchanges of opinion. Most conferences are participated in by individuals who have reached their positions by force of character. Having that they also possess pretty decided ideas. Therefore in too many cases they enter the conferences with the idea of imposing their wills on others rather than of learning the truth. A conference is worth nothing if it is not based on an honest desire to get at the truth in order to lay out a course of action. It will only succeed when the arguers realize that it is not the argument that matters, but the truth.

Nutrition—A new approach to the study of nutrition is being undertaken by the North Carolina State Board of Health, the University of North Carolina, Duke University Medical School, and the Rockefeller Foundation. Proceeding on the theory that the basis of sickness prevention lies in the building of healthy bodies that are able to resist infection, several North Carolina families are being placed under 7 day observation periods for the purpose of determining the immediate effects of

specific diets. Individual records are being kept for each member of the families under observation, each of whom is given a thorough physical examination prior to going on a supervised 7 day diet. Important conclusions are expected to result from the comparison of blood analyses made before and after the 7 day diet. It is hoped that data resulting from this study will lead to effective ways of combating the subclinical dietary diseases which perhaps frequently lead to degenerative illnesses.

CATCH-ALL

Since Sweden has fallen under the domination of a foreign power, it is doubtful that the Nobel prizes will be awarded this year. A movement is now under way among former Nobel prize winners to keep the custom alive by transferring to some agency in the United States authority to make the awards. . . . Under the auspices of the American Red Cross and Harvard University, plans are under consideration for the establishment of a hospital in England for the study and treatment of communicable diseases under wartime conditions. . . . Joseph Meister, who at the age of 9 was the first person to receive the Pasteur treatment for rabies in 1885, committed suicide in Paris recently. Apparent reason: Despondency over being separated from his relatives after the occupation of Paris. . . . It is reported that pure narcotics have become so scarce that many addicts are curing themselves unwittingly by buying highly diluted products. . . . The Blood Transfusion Betterment Association has been organized in New York City to mobilize volunteer blood donors to supply blood plasma for use in transfusions to the British war wounded. It is hoped that 300 liters of plasma will be obtained every week for shipment by Clipper plane. . . . Statisticians of the National Safety Council announced that America's traffic toll for the first half of 1940 was 1,040 greater than for the same period last year. Deaths for the first 6 months of this year totaled 14,740 compared with 13,700 at the halfway point last year—an increase of 8 per cent. . . . Thirty per cent of the recent volunteers for United States Army service in the New York metropolitan area were rejected because of bad teeth, poor vision, flat feet, bad hearing, or general debility. . . . The President's Interdepartmental Committee to Coördinate Health and Welfare Activities has requested an appropriation of 5 million dollars for the purpose of supplying health and medical services to migratory workers. . . . Next to the venereal diseases, mumps is the most disabling of the acute infections among military recruits. . . . Cuban postal authorities are issuing a stamp to commemorate the founding of Cuba's first medical journal which was established a century ago. . . . A diet for expectant mothers costing only 34 cents a day has been worked out by nutrition experts at Columbia University. The diet is said to provide generous amounts of all the necessary food substances. . . . Authorities in New York State have appointed a trichinosis commission to investigate all phases of the disease and to recommend appropriate legislation looking to its control. . . . Metro Goldwyn-Mayer Pictures has released a short subject picturing the experiences of Dr. Joseph Goldberger, who did pioneer work in discovering the causes and cure of pellagra. . . . According to Perrin H. Long, M.D., of Johns Hopkins Medical School, 300 tons of sulfanilamide and its allied compounds were used during 1939. . . . Memo to our readers: Don't forget that the editors are expecting contributions from you and you and you.

Abstracts

A Symposium on Adolescence

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As the concept of the medical and nursing part of the school health program broadens beyond the mere correction of physical defects, interest grows in the service that might be rendered to secondary schools. With new knowledge of growth, not only in terms of increase in mass, volume and external dimensions, but of development in the sense of increasing complexity, we become increasingly aware of the possibilities for the physician and nurse in the school to serve the educators who are concerned with the whole child in high school education. This awareness of an undeveloped field for public health service probably accounted for the enthusiastic reception which was given to the Symposium on Adolescence presented at a Joint Session of the Child Hygiene and Public Health Nursing Sections of the American Public Health Association and the American School Health Association at Pittsburgh, October, 1939.

Studies on Growth and Development of Adolescents and Their Implications for the Health Program of the Adolescent—William Walter Greulich, Ph.D.

The Symposium was planned to indicate the results of those studies on growth and development of adolescents which have definite implications for the school health program. This phase was presented by William Walter Greulich, Ph.D., of the Adolescence Study Unit of Yale University, School of Medicine. He indicated those growth patterns and trends in growth and development of adolescents which are essential for interpreting to the educators such individual differences as affect the adolescent's adjustment to school demands.

Changing Body and Changing Self—Caroline B. Zachry.

Dr. Caroline B. Zachry, as Chairman of the Study of Adolescents for the Commission on Secondary School Curriculum of the Progressive Education Association, presented an equally helpful discussion of the interrelationships of the physical and psychological factors which influence the behavior of the adolescent. With illustrations from case studies, she showed some of the interpretations necessary for meeting the perplexities commonly seen among high school pupils and influencing health as well as emotional equilibrium.

The Adolescent in a Changing World—A Summary—Lawrence K. Frank.

Lawrence K. Frank of the Josiah Macy, Jr. Foundation, in a very practical summary of current investigations of adolescent development pointed out that "medicine and public health have more to contribute to secondary education than physical examinations and correction of defects." He was particularly inspiring as he suggested new fields of service through an under-

standing of how social and cultural situations affect boys and girls in this period of physiological instability and as he suggested that medicine and public health might foster the clinical attitude and bring the new knowledge of adolescent growth and development to education, in order to protect adolescents from educational exploitation and the neglect of individual needs.

Journal of School Health (3335 Main St., Buffalo, N. Y.), May, 1940.

Annual Membership Roll Call, November 11–30, 1940

BOOKS AND REPORTS

Civil Service in Public Welfare—*By Alice Campbell Klein. New York: Russell Sage Foundation,* 1940. 444 pp. Price, $2.25.

The increasing shift of personnel engaged in the practice of public welfare from private to civil service auspices has created a widespread need for this manual to guide the social worker in her local civil service problems. The author in her many years of experience in the fields of public health and social work has been in position to familiarize herself with general placement problems in public welfare work as well as with state-wide civil service examinations.

The extension of civil service into the realm of public welfare has brought problems to the foreground in the program of the social worker demanding a clear and workable knowledge of a hitherto vaguely understood field.

The book is divided into two main parts. Part one, dealing with the functions and procedures of civil service, is intended to serve as an introduction to civil service history and practice. Part two, "Where Social Work and Merit Systems Meet," considers in detail those points where civil service affects the realm of public welfare. An appendix outlines the standards for a state merit system of personnel administration.

The twofold objective of the modern civil service program is, the author declares, the application of the merit principle to the selection, promotion, and management of government personnel, and the achievement of security of tenure, reasonable working conditions, and adequate compensation for the employees. Our present merit system can only be understood after a consideration of its historical backgrounds and the changing political concepts. A brief discussion of civil service history is included together with definitions of the terminology employed by students of the civil service system. The growth of the program in the United States is traced through federal, state, county, and municipal legislation, and emphasis is given to the recently developed special departmental systems established under the impetus of the Social Security Act in states still lacking state-wide civil service systems.

But the path of civil service progress has been beset by serious impeding forces. These are considered under the headings: inadequate appropriations, preferences to special groups, residential restrictions, disregard of merit rules in choice of candidates, and a tendency to include financial need as a basis for selection. Examples of the functioning of these forces are presented as well as the dangers inherent in their practice. In summary, the author maintains that the merit principle in public personnel administration is under constant attack because it cuts across all forms of special privilege.

The problem of civil service organization is next treated with special reference to the use of the bipartisan commission as against the bureau chief directed department, it being pointed out that both plans have proved workable.

The importance to social workers of a knowledge of the functions and technics of civil service agencies is stressed. The major functions of the agency are discussed in detail including the classification of positions and com-

pensation, recruitment and selection of personnel, examinations, scorings and types of certifications, conduction of periodic ratings, provision for in-service training, vacations, and the handling of appeals. Attention is especially directed toward the practical aspects as well as the aims and purposes of the various procedures. Advantages and disadvantages of certain types of examination questions are considered and numerous examples are supplied. A plea for an objective view toward oral examinations is included which is followed by a discussion of the need for a revision of opinion regarding the great value of the interview in the evaluation of a candidate.

The second division of this work deals with more controversial aspects of the problem. The author maintains that the application of merit systems to public social work is so recent that only tentative opinions may be held.

The future development of the merit system depends in turn upon the social worker, and definite ways in which members of this group can help its promotion are outlined. The need for cooperative action with other community groups which share the social worker's objectives is stressed. The advantage of a flexible administration and compromise is noted, while at the same time the author insists that public welfare positions be fully protected against encroachment by special groups.

IRA V. HISCOCK

Psychiatric Clinics for Children: With Special Reference to State Programs—*By Helen Leland Witmer, Ph.D. New York: Commonwealth Fund,* 1940. 437 pp. Price, $2.50.

This book is much more than its title indicates. It is by no means a dry compilation of facts and figures of psychiatric clinics and state programs. The Introduction, contrary to the usual manner, actually tells us what we are to expect in the following chapters. Chapter I on the "Basis of Child Psychiatry" with just enough theory to give it spice is delightfully written and gives one a clear-cut picture of the development of psychiatric clinics in this country with special reference to the influence of Adolf Meyer, William A. White, G. Stanley Hall, and Salmon. It points out clearly the unique contribution of Meyer in centering "interest in total behavior and in the social and emotional genesis of mental disorders."

The early history of psychiatric clinics for children and the development of demonstration Child Guidance Clinics together with a summary of present clinic services complete the first part of this instructive volume. The second part concerns itself with a survey of state financed clinics with considerable detailed material.

The third part lays down principles for future programs based upon the experience already gained. Theory and practice are judiciously balanced throughout. The book is well conceived and exceedingly well written. It should prove very helpful to all those who are struggling to bring body, "mind" and "soul" together in this topsy-turvy world.

RICHARD A. BOLT

The Development of Public Health in Canada—*Edited by R. D. Defries. Toronto: Canadian Public Health Association,* 1940, 184 pp. Price, $1.25.

This most useful and interesting book opens with a Preface by the editor which gives a summary of leading facts. The first article, "Public Health in Canada," is by Dr. Heagerty, who is so well known for his history of medicine in Canada. These are followed by articles written by the Health Officers of each Province and, except for an Appendix giving the public health expenditures by the Provincial govern-

ments for 1937, the book ends with a description of The Health Section of the Department of Pensions and National Health, Canada, with its many activities.

The Dominion of Canada as a country dates back to the British North American Act of 1867, though the Eastern provinces especially had been settled long before, hence many "firsts" can be justly claimed. The first census of the world in modern times was in Quebec in 1666, followed by the first system of records of birth, marriages, and deaths in that Province in 1667, a system which has been continued and which gives Quebec "a heritage of vital statistics unique in the world." The Indians had discovered a cure for scurvy and given the information to Cartier who used it successfully, antedating James Lind's discovery of lemon juice by more than 200 years. We are accustomed also to thinking that the French are backward in what we now call public health, yet from the date of the establishment of the Colony of La Nouvelle France more than 300 years ago, registration of births, marriages, and deaths was regularly carried on by the clergy, and in 1667 we find the people meeting to demand legislation concerning the quality and weight of bread, and in 1707, an act was passed to insure proper handling of meat. Child welfare also had some consideration. The Hôtel Dieu was opened in 1639. In 1721 the Intendent introduced quarantine regulations to prevent the importation of plague from Marseilles. While the new country, through certain provinces, thus gained a great deal from France, the Dominion of Canada, formed by the British North American Act in 1867, has largely followed England, whose great Public Health Act, passed in 1875, led in 1882 to the adoption of a public health act in the Province of Ontario, which was the most important public health legislation which up to that time had taken place in Canada.

The record of contagious diseases in various parts of Canada in the early days is sickening. The editor well says, "No part of the story of Canada is of greater interest than the attempts made by the pioneers to meet the ravages of disease." The Indians, according to Cartier, showed many signs of illness, blindness, lameness, and weakness. With the appearance of the whites the diseases of the civilized men rapidly spread to the Indians. Smallpox occurred in repeated epidemics, creating great ravages and nearly exterminated some of the tribes in eastern Canada. Perhaps next to smallpox—and by some placed first—was a succession of epidemics of cholera beginning in 1832. Typhus raged at times. Its prevalence in 1847 led to the appointment of 75 boards of health, and two years later a Central Board of Health was established to deal with epidemics. Influenza took a heavy toll in 1826.

While Canada had a Department of National Health in the Dominion Government, which was a decided advance in the organization of general public health measures, a Federal Department of Health was not created until 1919, following the World War. This has fostered a close relationship between the Provinces and the government in all health matters. There has been also developed a Dominion Council, an advisory body made up of the medical health officers of all the Provinces with certain other representatives.

The Editor makes graceful acknowledgment to the Rockefeller Foundation for the creation of a School of Hygiene at the University of Toronto, which, in addition to many other useful functions, now has fellowships for training public health personnel. The Rockefeller Foundation has also provided fellowships for health officers, public health nurses, and other public health depart-

ment personnel, and has participated in many other public health projects.

The accounts given by the health officers of the various Provinces are very interesting, and well repay one for the reading, but only a general review can here be given. This history is a well planned and well done work for which all owe a debt of gratitude to the Editor, writers, and to the Canadian Public Health Association.

MAZŸCK P. RAVENEL

Nursing Mental Diseases — *By Harriet Bailey (4th ed.). New York: Macmillan,* 1939. 264 pp. Price, $2.50.

The author has had years of experience as an educator and administrator in the field of mental nursing and also wide contact with schools of nursing as inspector of schools for the University of the State of New York. She refers in her preface to the growing acceptance of the inclusion of psychiatric nursing in the basic course of our nursing schools, hence, the timeliness of this expansion of her textbook on this subject.

The chapters are logically arranged, beginning with a brief but interesting history of the "Care of the Mentally Sick," and including such important subjects as "Some Legal Aspects of Mental Disorders," and of special significance to all nurses, a discussion of "Personality Development, Alteration and Adjustment." These introductory chapters are followed by a discussion of causes, a general classification of mental disorders (using the revised classification adopted by the American Psychiatric Association), symptoms and how to observe them, a discussion of qualifications for mental nursing leading directly into some of the difficulties in dealing with such general nursing problems as the administration of food, the nurse's part in aiding the patient to overcome insomnia without undue dependence on drugs, and some of the safeguards in dealing with the mentally ill. After a brief chapter on accidents and emergencies and the nurse's part in dealing with or preventing them, the author takes up chapter by chapter various classes of mental disease.

The same general order is used in discussing each subject, a definition of disease, physical symptoms, mental symptoms, nursing procedures and occupations, diversions and exercise, as it applied to each type of illness. The last three chapters deal more in detail with the therapeutic measures especially developed in a hospital for the mentally ill, giving for example detailed lists of occupations for men and for women, games and recreation; then the physiotherapy treatments and their significance; winding up with a chapter on mental hygiene.

While this book points out the positive and preventive aspects of the nurse's work in the mental health of all patients and their families with whom she comes in contact, still it is so definitely written for the nurse working with the mentally ill that its use for the young student should be introduced only after adequate preparation in general psychology and with the interpretation of a wise teacher. Miss Bailey indicates the appeal of this field of nursing to the intelligent nurse, but she would have made it even more challenging if she had added more concrete illustrations of human behavior such as the two examples given in the chapter on therapeutic measures. The bibliography and glossary add to the usefulness of the textbook.

MARGUERITE WALES

The Law of Public Housing— *By William Ebenstein. Madison: University of Wisconsin Press,* 1940. 150 pp. Price, $1.75.

Since bad housing unquestionably fosters disease, crime, and other social ills, it is the proper function of govern-

ment to use its police power, its tax power, and its power of eminent domain to eradicate slums and blighted areas. The need for such action, the status and operation of federal and state housing legislation, the attitude of the courts on these matters, and the housing experiences in foreign nations, are set forth in this scholarly, well documented book. Appendices give the texts of the United States Housing Act of 1937, and two leading court decisions. There are a table of cases and a good index. The book should be valuable to all who are concerned with public housing as a social, sanitary, and legal problem of great current significance.

JAMES A. TOBEY

Refuse Materials: Classification of Refuse Materials, Definitions, Characteristics, Quantities Produced—All in Relation to the Problem of Refuse Collection—*Bulletin No. 8. Chicago: American Public Works Assn.*, 1940. 44 pp. Price, $.50.

This bulletin by the Committee on Refuse Collection of the American Public Works Association will eventually become a chapter in "Refuse Collection Practice"—a larger publication of this association.

After defining various classifications of refuse and describing methods of measuring quantities of this material, the committee has given the amounts actually collected in various cities. These data were obtained from nearly two hundred municipalities located throughout the country.

The wide variations noted in these quantities would tend to make predictions of amounts to be collected rather difficult. However, when local conditions are considered, accurate estimates can probably be made, not only for a particular city but for seasonal variations within that city.

The estimates thus obtained will be of value in planning collection activities and equipment and in financing operations. They can also be used for estimating incinerator capacities, land fill areas or quantities of other disposal facilities.

F. J. MAIER

Third Annual Symposium, Department of Industrial Medicine—Northwestern University Medical School. *Chicago: Northwestern University*, 1939. 125 pp. (flexible cardboard covers). Price, $2.00.

The symposium was held September 25 and 26, 1939, and devoted to scientific sessions followed by a banquet session with an address by Dr. Walter L. Bierring, Health Commissioner of Iowa, upon "The Past and Future of Preventive Medicine." Papers in the Scientific Sessions were as follows: Nontuberculous pulmonary diseases, by Ernest E. Irons (clinical aspects) and Hollis Potter (radiological aspects); kidney diseases of mid-life, by Hermon O. Mosenthal (clinical aspects) and J. P. Simonds (pathological aspects); soap—a cleanser and irritant and its rôle in occupational dermatitis, by James Herbert Mitchell; welding—gas and electric, by Eugene L. Walsh (importance as a health hazard) and James A. Britton (protection of operators); and a group of four papers on common beneficent uses of poisonous metals and alkaloids—economic importance and health hazards: (1) Lead and lead alloys, by Marcus A. Grossmann; (2) health hazards and the use of "Ledloy," by A. G. Kammer; (3) metallic salts and alkaloids in agriculture, by Ray Hutson (entomologist); and (4) protection of the health of the grower, the handler, and the consuming public, by W. A. Ruth (horticulturist). The discussions following the various papers are with the report and constitute a very valuable feature.

The Department of Industrial Medicine was established in 1936 as a section of General Medicine, is supported

by a group of industries and the university, and coördinates the equipment and staffs of the various departments of the university and Passavant Hospital. The purpose is an intensive study of individuals who claim disability through occupational exposure, with methods of treatment and essentials in prevention, while actual cases are used for teaching and the department disseminates useful information not only to those immediately concerned but to public officials and the general public.

As with the preceding annual reports, the format is a photoprint of carefully edited typed material with the inclusion of photographs and charts. Several papers give extensive references. The table of contents serves as an index.

The whole project with the annual symposia comprise a well conceived and virile contribution from one of the most extensive industrial centers in the world.

EMERY R. HAYHURST

Digest of Laws and Regulations Relating to the Prevention and Control of Syphilis and Gonorrhea in the Forty-eight States and the District of Columbia—*Compiled under the direction of Bascom Johnson, LL.B. New York: American Social Hygiene Assn.*, 1940. 438 pp. Price, $5.00.

State legislation for the control of the venereal diseases in effect on September 1, 1939, and the rules and regulations of state health departments on this important subject, have been ably summarized in this well printed and well arranged book. The digests of the laws and regulations are presented for each state under the headings: (1) power to make rules and regulations; (2) relations to public health; (3) reporting; (4) examination; (5) treatment; (6) quarantine; (7) infecting or exposing another to infection; (8) advertising cures; (9) sale of remedies without prescription; (10) requirements pertaining to marriage; and (11) ophthalmia neonatorum.

Appendices give brief digests of federal laws and regulations on venereal disease, and specimen state laws on vice repression, and on premarital and prenatal examinations. There is a Foreword by Surgeon General Thomas Parran of the U. S. Public Health Service, which coöperated in the preparation of this useful book, and which might well have published it, so that it would have been available without charge to the payers of the innumerable manifest and hidden federal taxes.

This Digest should be valuable to all who are interested in new, and perhaps better legislation on venereal disease control, provided that they use it as a guide and not merely as a model.

JAMES A. TOBEY

Health Syllabus—*Mississippi State Board of Health, Jackson, Miss.* 1940. 63 pp. Distributed free of charge.

This booklet of 63 pages is excellent. It begins with "A Brief History of Health Work in Mississippi," and has arranged by years in tabular form "Milestones of Public Health in Mississippi, 1799–1938." It describes the organization of the State Board of Health, and in page after page covers not only the duties performed but gives to the lay public an idea of the necessity of these functions. At the end there is a list, under appropriate headings, of pamphlets which can be obtained free of charge from the State Board, also a good index.

The Syllabus was prepared for use in secondary schools and is excellently adapted to the purpose. At the end of each subject are questions which emphasize the points in the text and insure their understanding. It can be recommended also to the general public, which as a rule knows too little of health affairs.

Among numerous excellent illustra-

tions are found reproductions of photographs of the first Board of Health of Mississippi (1877) and of the secretaries since the year 1877. The printing and make-up are excellent.

MAZÝCK P. RAVENEL

Panum on Measles: Observations Made During the Epidemic of Measles on the Faroe Islands in the Year 1846 (A translation from the Danish)—*By Peter Ludwig Panum. New York: Delta Omega Society, 1940. Distributed by American Public Health Association.* 111 pp. Price, $2.50.

Here is a model of dignity, restraint, honesty, accuracy and intellectual stimulation; a rare and precious publication: 111 pages of medical treasure, named from the kernel of 20 pages in which the observations of that remarkable physiologist and epidemiologist, Peter Ludwig Panum first revealed his quality in analytical literature.

From the frontispiece portrait of the rugged devotee of truth and logic to the final tabulation of complications causing deaths of measles patients, there is not a superfluous or irrelevant word.

Preventive medicine whether as a science and art or as a cultural and historical discipline of higher education, is indebted to the Delta Omega Society for adding this volume to its series of classical texts in public health.

The editorial direction has been scholarly and sympathetic. The note on the transmission and the introductory chapter by Dr. Doull are sufficient and admirably expressed. The biography of Dr. Panum by his contemporary and colleague Dr. Peterson illuminates the record of a professional career of 40 years following his first official duties as a candidate in medicine and surgery when sent to the Faroe Islands in July, 1846.

Nothing could be more satisfying as foundation, background, and preparation for the analysis and conclusions on the epidemic than the description given by the observant physician of the characteristics of the Islands, their climate, the people, and their work, habitations, clothing, and eating habits, and the bearing of these on the prevalence of such diseases and causes of death as distinguished these unique communities of hardy folk from those of contemporary Denmark. It is not only to the good fortune that the translators of the several texts of Danish authors have been persons of high cultural attainments, that we can credit the high literary quality of the text. The authors themselves and particularly Dr. Panum used language as an exquisite tool for expression whether in description or analysis. There are gems of brevity and lucidity which are in sharp contrast to the often slovenly and overloaded journalese of health department reports of today in this country.

Part II of the Panum text, pp. 54 to 73, is the treasure trove of the volume, already made familiar to many students of epidemiology and communicable disease control through the teaching of Frost, to whom most appropriately and with universal affection the volume is dedicated.

This little book in its modest brown binding, with its simplest of titles cannot fail to be deeply satisfying to the soul of sanitarians. It should serve as a testament for all disciples of clear seeing and honest thinking.

The three appendices serve a useful purpose as notes and supplementary confirmation of the main text.

Bibliophiles may cavil at certain unorthodox printing practices in the matter of Latin words and phrases, but this is a trifling detail compared with the general excellence of the volume in form and substance.

Like the republished volumes of Budd and Snow, this book will be sought, studied, and appreciated by

physicians and others concerned with preventive medicine and public health as long as reason rules. This is an indispensable book.

HAVEN EMERSON

Fourth Saranac Laboratory Symposium on Silicosis—*Edited by B. E. Kuechle. Wausau, Wis.: Employers' Mutual Liability Insurance Co.*, 1939. 370 pp. (paper). Price, $3.00.

This report is by far the most extensive of the four covering as many symposia on silicosis held at Saranac Lake, 1934, 1935, 1937, and 1939. It comprises 36 papers presented June 19 to 23, 1939. The Chairman, Dr. Leroy U. Gardner, pointed out that this symposium, was a radical departure from previous ones in that basic facts pertaining to etiology, pathology, roentgenology, diagnosis and prevention, which previously constituted the entire subject matter, were presented in abbreviated form for the first day's program, to accomplish which some of the speakers prepared comprehensive outlines of their subjects. Many of the corresponding papers, however, appear to be unabridged. The next three days dealt with conditions in specific industries, beginning with those which have no particular dust hazards, and passing in succession through those involving the use of increasing quantities of silica. Thus, mining in dolomite, the gypsum, cement, granite, Ontario gold mining, and the foundry dust problems come in for major attention. The asbestos industry has been purposely omitted for lack of time and because experience is still limited. The last papers are devoted to the subjects of prevention, control, and compensation.

Most subjects of long standing interest have been brought up to date in keeping with new knowledge and opinions. A brief summary is given of the discussions which follow most of the papers, from which it is evident that, while majority agreement is assuming form on many mooted questions, there is still division of opinion on many others. A symposium of this sort presents unequalled opportunity for announcing new observations, also of more closely defining the terms and expressions commonly used. The reviewer is moved to ask whether the expression "tuberculosis positive" should not be unequivocally defined? Is it based on clinical, pathological, and x-ray findings or upon actual demonstration of the presence of the tuberculosis organism itself? Has the disability been due to the tuberculous element or was tuberculosis simply found as a terminal affair, a "clean-up squad" in a previous condition of extreme pathology of other types, including non-tuberculous infection?

Space does not permit a listing of the titles of the papers presented, which, however, fall under the general groupings above mentioned. As an Appendix there is included the "Physical Examination of Industrial Workers," recently promulgated by the Industrial Commission of Wisconsin. There were many discussants including some from abroad, and it may be said that an outstanding representation of North American specialists and practical men in the field were present and took part.

The volume contains a number of illustrations and many tables and charts. It represents American and Canadian observations in which the influence of many types of industries enter the picture in contrast to reports from foreign sources, which, while extensive and very complete in themselves, have usually been confined to certain industries or localities.

A fairly comprehensive subject index is included but lacks certain headings, e.g., "prognosis" and "progression of silicosis." Inasmuch as a number of the papers carry references, an author index might well have been added and

particularly an index of the names of discussants. The volume, which is of flexible type with paper covers, is well bound and printed on excellent paper with careful editing and make-up.

To the constantly enlarging group of those interested in silicosis and the effects of other (mineral) dusts and mixed dusts, it is an indispensable work, and one gains the impression that this subject, which has so many ramifications, is gradually coming under mastery with much of more facts and less of theory. EMERY R. HAYHURST

The Reorganization of Public Assistance: Report, 1938–1939—*New York City Department of Welfare. New York: Department of Welfare of New York,* 1940. 193 pp. (Gratis to public officials, etc.)

The present report covering the 18 month period from January, 1938, to July, 1939, is an account of the way in which the Department of Welfare has discharged its task of providing public assistance in New York City. At the start of this period the various welfare activities of the city were integrated under the reorganized department of three main bureaus whose chiefs are directly responsible to the Commissioner of Welfare. All the relief giving functions are coördinated in a Bureau of Public Assistance whose task includes the provision of consultant and supervisory services to the other divisions. The Bureau of Finance and Statistics prepares budget estimates, handles statistics, estimates relief loads, and has charge of accounting, auditing, and the issuance of some 450,000 relief checks monthly. The Bureau of Personnel and Special Services has among its duties the responsibility for the investigation of charges made against employers, and the bringing of legal action against recipients accused of fraud, as well as the direction of the activities of the personnel. The work of the former Emergency Relief Bureau was absorbed by the reorganized department, thus allowing a spread of benefits formerly limited to each of the old units, to the entire field covered by the new administration.

The report is composed of 18 chapters with two final sections devoted to financial and case load statistical tables. Several helpful charts and interesting photographs supplement the text material.

The first 7 chapters deal with a survey discussion of the entire problem, unemployment relief, the set-up and chief functions of the new department, its relations to its employees, to other community groups and the civil service, and administrative costs. The remaining chapters are devoted to a detailed account of the work of the specific relief services through which the department must perform its task.

Following an account of the history of the rise of the city's load of unemployment relief since 1931, which points out the final acceptance of the responsibility of caring for the needy on the part of every level of government, the Commissioner considers the types of persons on relief, noting that 65 per cent of new cases accepted during a 2 month period were persons already known to the department. An analysis of causes of application for aid revealed that more than half the applicants had lost their position in private industry, about one-fifth of the causes were related to illness. Loss of WPA work accounted for 15 per cent of the total, insufficient wages in present employment to meet the needs of their family for 7 per cent, and another 7 per cent had exhausted their unemployment insurance funds. Other aspects of the unemployment relief problem treated include the lag between business and employment curves, unemployables, social insurance and decent wages as a factor in the reduction of relief.

"Any program of work for the blind carries responsibility for aiding in the prevention of blindness." Although the function of the division is primarily the rendering of financial assistance, help is often available through the medium of the medical social worker to arrange proper medical care in individual cases where blindness might be prevented or its onset delayed. Thirty-three blind persons made self supporting, admissions of the blind to "talking book" sessions, and guide service, were among the other services rendered by this division.

The Medical and Nursing Service division has done valuable work in securing visits to the homes of needy patients suffering from acute, minor, house-confining illnesses which are presumably curable in a 2 week period. Pharmaceutical and dental care was also provided. The method by which the recipient secures these services with the combined aid of the district office and medical social worker is outlined. Obstetrical service at home and care of chronic cases is provided, and the criteria for acceptance of such cases are listed. The manner of provision of special diets, surgical appliances, optical supplies, and medications is discussed.

"It is perfectly clear that the only complete and final answer to the relief problem under the American system is jobs at decent wages for all employable people." It is stated that to guard adequately against the hazard of unemployment the system of unemployment insurance should be extended to cover all employed persons and be weighted in favor of the low paid worker. If the benefits could be further weighted in terms of the number of dependents for whom the worker is responsible, the number of relief applicants would be reduced sharply. The extension is urged of medical and nursing care to the low paid worker while employed, since illness is one of the chief causes of destitution and unemployment.

IRA V. HISCOCK

Quantity Food Service Recipes—*Compiled by the Administrative Section of the American Dietetic Association under the direction of Adeline Wood. Philadelphia: Lippincott*, 1940. 436 pp. Price, $4.00.

This book is an excellent collection of recipes gathered from those used in many hospitals, college and school dining rooms, school cafeterias, restaurants, and hotels. These recipes have been compiled by a group of women, who have had real practical experience in Quantity Cookery in both large and small institutions, and are interested in raising the standards of food production and serving of good food as well as serving nutritive and palatable food.

Quantity Recipes are printed on an especially good quality of paper in order to resist much hard usage in the kitchen. Each group of recipes is introduced with an attractive cartoon and a very fitting quotation. The list of dishes to be found in each group precedes the recipes, thus quickly giving the seemingly exhausted menu maker an inspiration without wading through a number of recipes.

The recipes are written in unusually good form, and the directions simmered down to the fewest possible number of statements, thus making it possible for anyone who can read to follow. Each recipe not only gives the ingredients and concise directions, but also the yield in bulk, and the number and size of servings.

Filled with "pet" recipes, this book is one that any person, who is responsible for food in quantity, whether for an institution of 50 or 500, will find an inspiration and help in making menus even though it is not a book of menus.

MARY AGNES DAVIS

Social and Biological Aspects of Mental Disease—*By Benjamin Malzberg. Utica, N. Y.: State Hospitals Press,* 1940. 360 pp. Price, $2.50.

This well edited and comprehensive book is a compilation of nearly 20 papers by the author who for several years past has been surveying mental health problems in the state of New York. The 15 chapters of the book are revisions and supplementations of his previously published researches. Dr. Malzberg says cogently that while great improvement has been effected in public physical health "we find an unfavorable picture with respect to mental health . . . If present trends continue, mental disease will soon become our foremost health problem." As he indicates in his Summary, p. 349, the mortality rates have decreased since 1920 and the first admission rates have increased, which means that expectation of mental disease at birth has increased between 1920 and 1930. "We have therefore the paradox that improve-in physical health, as measured by decreased death rates, accompanies, and is, in fact, a partial cause of the increase in mental disease." As the population itself grows older there are more potential people to suffer from the senile psychosis.

Is mental disease increasing or is its earlier detection and the factor of improved hospitalization encouraging more commitments? As above indicated, increased life expectancy is adding to the mental health problem. What of age, marital status, race and parentage as ancillary factors? These are the old and familiar posers which receive extensive consideration and clarification. There is a great deal of detailed statistical work which loses its aridity by virtue of the very readable and succinct text. The 28 page paragraph (chap. 14) discussion of insulin therapy in schizophrenia is sober and moderate in its approval, thus stated "there is good reason to feel encouraged. . . ."

One might well read the final chapter or Summary before the main text. This section gives a clear chronological story of the mental hygiene developments in New York State and also brief, pointed facts which are treated more at length in the text itself.

One cannot do justice in a brief résumé to the painstaking efforts which have gone into this work. Despite the unavoidable formalistic analysis and statistical tinge, we have no hesitancy in recommending this as a necessary text to all who would presume a responsible participation and knowledge in the field of mental health.

M. A. R. HENNESSY

Thirty-third Annual Report of the Metropolitan Water Board, 1938—*By Lt.-Col. E. F. W. Mackenzie, O.B.E., M.C., M.B., D.P.H. London: P. S. King & Son, Ltd., 14, Great Smith Street (Westminster),* 1940. 118 pp. Price, $2.75.

This report is divided into 4 main sections, namely: bacteriological, biological, chemical, and the works efficiency. The introduction includes a detailed description of the new laboratories. In addition to the introduction and the 4 main sections, several other topics of special nature are covered, such as sewage investigation, complaints, special investigation of the Thames River, meteorological notes, routine tables, and references.

The bacteriological section reports upon investigation of the use of brilliant green bile as confirmation of presumptive coliform, investigation of the growth of citrate solution, research for simpler and more specific methods for the detection of the various members of the coliform group, investigation of the Clostridium Welchii test, and examination for the presence of streptococcus and *Bact. paratyphosum* B in

water and sewage. The rôle of soil bacteriology in the examination of water and their relation to tastes is discussed.

The biological section reports upon a study of seasonal variations in plankton in reservoirs. Photo micrographs are made of the samples. Investigation has been made to determine a simple technic for the evaluation of microörganisms.

Some studies were made of the algal flora on filter beds. In addition to the biological work as it applies to the control of filtration and odors, experimental work has been undertaken to forecast when certain organisms may be present.

The chemical section reports upon an investigation of free carbon dioxide in well waters and a study of the dissolved oxygen of the Thames, Lee, and New Rivers and the wells. Chemical analyses were also made of mud taken from the bottom of reservoirs. The chemical section has been working closely with the biological section in its forecasting work.

The works efficiency section reports upon the use of ammonia and chlorine in the treatment of certain supplies and the effectiveness of pre-chlorination. There follows a detailed report upon the samples and operating data at the various filtration plants.

About 40 per cent of the report is devoted to tabulations of results obtained by the various sections in their work.

The report closes with a long list of references on water supply subjects and an abridged index of most of the subjects appearing in previous annual reports and research reports of the Metropolitan Water Board.

M. H. BIDWELL

Industrial Hygiene—*By Various Authors, Edited by A. J. Lanza and Jacob A. Goldberg. New York: Oxford University Press,* 1939. 743 pp. Price, $8.50.

This volume represents the combined efforts of a group of medical specialists centered chiefly in New York City and environs, aided by several men long known in the field of industrial hygiene such as C. D. Selby, Henry H. Kessler, A. J. Lanza, Louis Schwartz, Paul Reznikoff, W. F. Von Oettingen, R. R. Sayers and William J. McConnell. Jacob A. Goldberg has contributed chapters on statistical considerations and problems in workmen's compensation; Harvey Bartle, on hygiene and medical care of workers on American Railroads, and Rosamond A. Goldberg, on the nurse in industry.

The editors have recognized the flexible and changing nature of the definition of an occupational disease and the ever-changing complexities of industrial hygiene which render the subject a difficult one to treat adequately. Emphasis is placed on the concept that industrial medicine is an important component of public health, and involves the principles of preventive medicine. "Industry" is an all-inclusive term, concerned with different kinds of labor which furnish us with everything we use. The growth of medicine in the industrial scheme has been slow but fairly logical. Industrial health hazards were among the first reasons, outside of inherent accidental mishaps, for bringing the doctor into industry. Workmen's compensation laws have resulted in bringing in a large number of part-time and a smaller number of full-time physicians. Thus industrial medical departments have arisen, increased in importance and activities, and the burden of sick absenteeism has greatly extended its scope.

The book is written with the needs and viewpoints of the industrial physician in mind, including important ancillary features such as special therapy, nursing, compensation, health edu-

cation, and the arousing of an inquiring attitude of mind in those engaged in the various sciences.

The chapters vary in length, depending upon the content, and are well balanced in this respect. There is a happy combination of the medical specialist who looks at industry and the relation of his specialty to it, and the experienced industrial physician, working with his technical aids. One is particularly impressed with the recentness of technical information, as well as of proposed and accepted standards. While occasionally one cannot find his specific questions answered, particularly in the chapters devoted to the more purely medical specialties, the book is the most comprehensive recent publication in the field in the English language, and is thoroughly authoritative. There are 50-odd illustrations, many tables, forms, chemical structural formulae and each chapter is followed with a list of references from which, unfortunately, the names of publishers of books are usually missing.

The index is comprehensive, is more topical than analytical, and covers both subject matter and authors cited in the text and references. We have found few errors or omissions. As is usual with the Oxford University Press, the volume is an example of the best printers' and binders' arts.

EMERY R. HAYHURST

For Daughters and Mothers—*By Valeria Hopkins Parker, M.D. Indianapolis: Bobbs-Merrill,* 1940. 138 pp. Price, $1.50.

It is not surprising that Dr. Valeria Parker, who has long been a popular lecturer to groups of young people, would be the author of such a readable and sane book, though it is surprising that any author could manage to talk to both mothers and daughters at one time in a way that appeals to both.

Dr. Parker has covered the usual facts of sex hygiene, of venereal disease, of personality adjustment and social behavior during adolescence, and of personal hygiene in simple and dignified language. The mother who has no words of her own with which to discuss sex with her daughter, will find many suggestions here even though these are not brought together in a "sample talk." This story of sex is woven into problems of amusement, fashions, and school life, so that it does not seem the only subject of importance to mothers and daughters.

There is little preaching in the book and at no point is one aware that the author is focusing unduly on some unpleasant duty that should be performed. Here is exactly the book which would be expected from a person who has long been of assistance to girls and their mothers. LEONA BAUMGARTNER

Parents and Children Go to School—*By Dorothy Walter Baruch. Chicago: Scott, Foresman,* 1939. 504 pp. Price, $3.00.

Dr. Baruch writes out of a full understanding of children and their needs, both from the viewpoint of a successful mother and that of a skillful teacher. She is professor of education and director of the Broadoaks Preschool, Broadoaks School of Education, Whittier College, Pasadena, Calif., where she presides over a program of education in relation to young children which is unique in its basic philosophy concerning the influences which play upon the lives of young children.

Dr. Baruch believes that home and family relationships are so influential upon the life of the child that no school should exist for young children, which does not have as a basic part of its program a close working relationship with the home. This viewpoint is far from that of a few decades ago when the home delegated to the school

the education of the child, and to a large extent followed a "hands off" policy.

Parents and Children Go to School is a day by day account of the activities of children, teachers, and parents in the Broadoaks Preschool. It describes the actual happenings there in the groups of 2 to 6 year old children. Doctors will find this book especially helpful in understanding the mental hygiene aspects of working with children and their parents. Teachers will find in it a clear, detailed, objective picture of a fine nursery school set-up. Parents will hail it for its healthy view of parent education, eg., that "parents aside from being parents, are people in their own rights," and therefore are entitled to any help which will give them a greater measure of security in bringing up their children.

ETHEL GORDON

Your Child's Food—*By Miriam E. Lowenberg. New York: McGraw-Hill.* 299 pp. Price, $2.50.

Here is a thoroughly practical book on feeding young children by one who understands the psychology as well as the physiology of the feeding of preschool children. The book properly opens with a consideration of food habits and their formation. It gives practical suggestions based upon actual observation of children and their nutritional needs. It does not blink the difficulties but meets them squarely with practical and workable suggestions. There are excellent chapters on planning menus for the family, food for special occasions, food preparation, and meal service. The food requirements of the child as a member of the family group are well considered. The book is replete with seasonal and weekly menus and many appetizing recipes.

A number of full page photographs of children in action in relation to their food enhances the value of the book. Parents, teachers, day nursery and nursery personnel will find much help here in carrying out successful feeding of young children.

RICHARD A. BOLT

Beyond the Clinical Frontiers. A Psychiatrist Views Crowd Behavior—*By Edward A. Strecker, M.D. New York: Norton,* 1940. 210 pp. Price, $2.00.

One who is not a specialist approaches a review of this book with diffidence, but since it has been recommended to physicians, nurses, parents, school teachers, and social workers, perhaps such a review will serve the purpose as well as one by an expert.

The author describes his work as a brief discussion of a few of the crises which are menacing our civilization and its cultures; an attempt to show the psychiatric implications of these crises and an outline of a plan of hygiene that psychiatry might be able to offer to a mentally sick world. The arrangement is logical and well carried out. The author does not hesitate to say that "the economic, political, social, cultural, and ethical upheavals" have perplexed a sorely tried and tired world. He realizes that these are "beyond the frontiers of clinical psychiatry"—and from this the title of the book is derived.

The first chapter "A Massive Retreat from Reality," discusses this "as a phenomenon common to psychoses, psychoneuroses, and many other conditions within the boundaries of clinical psychiatry." There is a kinship between the minds of the mentally sick, the thinking of average normal individuals, and the mass behavior of crowds. Pressure from the outside is constantly increasing. Present conditions are making an increasing number of individuals vulnerable though there are personalities which have "enough insulation of intelligence to protect

them against the danger of crowd emotional contact." Mass reactions are more common than ever before. Our democracy has not protected us from crowd mindedness " and the mass-man has appeared in the United States." The weight of evidence is that " a crowd thinks, feels and behaves on a much lower level than those customary to the individuals composing it. The debasement of behavior is the deeper as the crowd increases in size."

One cannot read the first five chapters without being depressed and asking, as the author did when a young psychiatrist, " What is sanity? " The answer given to him was that " sanity was a capacity for being dextrous in the matter of keeping out of insane asylums." The hopeful part of the book is found in the last four chapters and the " Prophecies." One is convinced of the need for mental hygiene before reaching the chapter which carries that title. Immediately following, " The Feasibility of Mental Hygiene " is discussed and then comes the long chapter on " Mental Hygiene Planning." Only a few points can be mentioned here. Mental hygiene has long insisted on the need for a reappraisal of the values of civilization. Material values need downward revision as the power they exert is greatly in excess of their cultural value and there is danger " that real cultures may be bludgeoned into insensibility by materialism "; " Environments will have to shift the frontiers of their realities "; that is, individuals must be given better opportunities of acquiring self-understanding and self-development with the result of becoming capable of inner sincerity.

The Foreword is illuminating. The book contains one of the series of The Salmon Lectures of the New York Academy of Medicine, and it is evident that the author not only had a profound devotion to Salmon personally, but that his professional life has been greatly influenced by association with Salmon. Of the many outstanding qualities which characterized Salmon the author remembers best " Salmon the humanitarian." Salmon had an unwavering faith in psychiatry—his " Cinderella of Medicine "—and gave the strength of both his body and mind unstintingly to this cause. The author feels sure that if Salmon were alive today he would be engaged in mobilizing psychiatric resources into some plan for repairing as far as possible the " wounds which have been inflicted upon a confused and disorganized society." He would use the tools at hand even if they were not as fine as he could have wished for.

We agree that this book needs to be read, and can be read, with advantage, by many classes of society. It is not easy reading, not a book to be taken up casually in a spare moment. It must be read, marked, learned, and inwardly digested to attain its full value.

We cannot close this inadequate review better than by quoting a prophecy: " The day will come when Salmon's Cinderella of Medicine, Psychiatry, will be honored as a wise and bountiful Social Princess dispensing a largeness of culture. In the meantime, as a branch of medicine and one of the subdivisions of biology, Psychiatry is busily engaged in utilizing a variety of scientific methods and through its handmaiden Mental Hygiene is fulfilling the duty of diffusing ' the knowledge that it gains ' and availing itself of the privilege as far as it is able of contributing ' to the lessening of human sufferings and the enhancement of human joys.' "

MAZŸCK P. RAVENEL

Your Marriage Problem — *By Norman E. Himes. New York: Farrar & Rinehart,* 1940. 434 pp. Price, $3.75.

Mixing sociology and sex is not new, nor are economics and marriage strangers, but until now we have had

no such attempt as this to describe and analyze the chief factors and the rôles they play for and against enduring happiness within social traditions of life.

Without superfluous detail, the embroidery of emotion, or partisanship of propaganda, the author assembles many of the best contributions of sociology and medicine of the past thirty years which offer facts and opinions worthy of attention by persons interested in marriage as it is approached, completed, and enjoyed by the post-war generation.

The author expresses his optimistic belief in the value of information and its understanding by youth as the best guarantees against the mistakes of their elders.

He has learned problems of the marriageable and the married from the experience of a "marriage counsellor," and while not as facile and sure in some of his medical discussions as in those of sociologic and economic importance he nevertheless expresses the essentials in each field with adequacy.

The reader is spared the usual doses of anatomy and physiology, and there is no offensive emphasis upon the commonly overemphasized psychology of sex. The uniqueness of the volume consists rather in the association of topics commonly dealt with in separate books and rarely discussed intimately and seriously by the wooing and the early wedded.

The buying, building, or renting a home, working of wives, budgeting, credit needs and uses, insurance, investment, come along cheek by jowl with problems of sterility, contraception, and child adoption, each in relation to the main purpose of scoring high in married happiness.

The references are abundant and well chosen, the index is adequate in topics and detail and the bookmaking good though not superior.

Professor Himes has given us not so much a piece of literature as a useful textbook for the convenience of the steadily expanding army of men and women who would listen and learn before and after the leap into marriage, and for those who serve as professional counsellors in the medical, social, economic, legal, and psychological problems of those who would live together permanently and happily.

If happiness in marriage can evolve out of the methodologies of the modern sociologist, this book may prove useful for that end. HAVEN EMERSON

The Way Life Begins—An Introduction to Sex Education—*By Bertha Chapman Cady and Vernon Mosher Cady (rev. ed.). New York: American Social Hygiene Association,* 1939. 80 pp. Price, $1.50.

The usefulness of this little book is proved by its frequent printings since 1917 and the wide popularity it has enjoyed. This edition, thoroughly revised and put out in attractive covers, with a number of full page colored plates, should continue its educational mission in providing parents and teachers, boys and girls with authentic information on sex education from the standpoint of nature study in plants and animals, leading up by gradual steps to the reproductive functions in man and woman. It affords a logical approach to the wider field of social hygiene in which the American Social Hygiene Association has been active and effective for over 25 years.

RICHARD A. BOLT

Water Supply and Sewerage—*By Ernest W. Steel. New York: McGraw-Hill,* 1938. 653 pp. Price, $5.00.

The author states this book is an attempt to present, for engineering students, those essentials of principles and present-day practice necessary to solution of the problems of water sup-

ply and sewerage. There are thirty chapters, as follows: Introduction, 7 pp.; Quantity of Water and Sewage, 20 pp.; Rainfall and Run-off, 29 pp.; Ground Water, 27 pp.; Conveyance of Water-Materials Used, 36 pp.; Conveyance of Water—Collection and Distribution, 40 pp.; Pumps and Pumping Stations, 44 pp.; Quality of Water Supplies, 32 pp.; Self-purification of Streams, 11 pp.; Treatment of Water—Sedimentation and Coagulation, 25 pp.; Treatment of Water—the Rapid Sand Filter, 24 pp.; Treatment of Water—the Slow Sand Filter, 8 pp.; Miscellaneous Water Treatment Methods, 26 pp.; Sewerage—Definitions and General Considerations, 5 pp.; Amount of Storm Sewage, 12 pp.; Sewer Pipes, 23 pp.; Flow in Sewers, 14 pp.; Sewer Appurtenances, 24 pp.; Design of Sewer Systems, 17 pp.; Sewer Construction, 20 pp.; Maintenance of Sewers, 7 pp.; Characteristics of Sewage, 19 pp.; Sewage Disposal, 14 pp.; Screens and Skimming Tanks, 10 pp.; Sedimentation of Sewage, 26 pp.; Sewage Filtration, 36 pp.; Activated Sludge, 18 pp.; Sludge Treatment and Disposal, 21 pp.; Miscellaneous Sewage Treatment Problems, 13 pp.; Financing and Management, 13 pp.; 2 Appendices and Index, 31 pp.

The book is well arranged and covers a wide field concisely for the purpose of general instruction. For health officers and others desirous of a general view of the field, the book should prove useful and informative.

LANGDON PEARSE

BOOKS RECEIVED

PROGRESS IN MEDICINE. Describing the Major Developments During the Past Hundred Years. By Iago Galdston. New York: Knopf, 1940. 347 pp. Price, $3.00.

THE STREPTOCOCCI. THEIR DESCRIPTIONS, CLASSIFICATION, AND DISTRIBUTION, WITH SPECIAL REFERENCE TO THOSE IN MILK. By William D. Frost and Mildred A. Engelbrecht. Madison, Wis.: Willdof Book Co., 1940. 171 pp. Price, $4.25.

CHILD CARE AND TRAINING. By Marion L. Faegre and John E. Anderson. 5th ed. revised. Minneapolis: University of Minnesota Press, 1940. 320 pp. Price, $2.50.

PSYCHOTHERAPY. By Lewellys F. Barker. New York: Appleton-Century, 1940. 218 pp. Price, $2.00.

HANDBOOK OF MATHEMATICAL TABLES AND FORMULAS. Compiled by Richard Stevens Burington. Sandusky, O.: Handbook Publishers, 1940. 275 pp. Price, $1.25.

FIRST AID TO INJURED AND SICK. By J. F. Sutherland. Philadelphia: Peter Reilly Co., 1940. 77 pp. Price, $.25.

THIS DYNASTY OF DOCTORS. By Rhoda Truax. Indianapolis: Bobbs Merrill, 1940. 397 pp. Price, $2.50.

OFFICIAL AND TENTATIVE METHODS OF ANALYSIS. Association of Official and Agricultural Chemists, Washington, D. C., 1940. 5th ed. 757 pp. Price, $5.00.

FOOD, NUTRITION AND HEALTH. By E. V. McCollum and J. Ernestine Becker. 5th ed. Published by the Authors, Baltimore, Md., 1940. 127 pp. Price, $1.50.

COMMUNITY HYGIENE. By Elizabeth Sterling Soule and Christine Mackenzie. Macmillan: New York, 1940. 218 pp. Price, $1.75.

HEALTH ACTIVITIES AND PROBLEMS. An Experience Workbook for the Secondary School Student. By D. Oberteuffer and P. C. Bechtel. New York: Houghton Mifflin, 1940. 147 pp. Price, $.60.

PROCEEDINGS OF THE DENTAL CENTENARY CELEBRATION, BALTIMORE, MD., MARCH 18, 19 AND 20, 1940. George M. Anderson, Editor. Publication Committee, Medical Arts Building, Baltimore, Md. Edition limited.

ELEMENTARY BACTERIOLOGY. History, Fundamentals, Pathogenic and Non-pathogenic. By Joseph E. Greaves and Ethelyn P. Greaves. 4th ed. Philadelphia: Saunders, 1940. 587 pp. Price, $3.50.

FUNDAMENTALS OF BACTERIOLOGY. By Martin Frobisher. 2d ed. Philadelphia: Saunders, 1940. 653 pp. Price, $4.00.

SAGINAW COUNTY DEPARTMENT OF HEALTH—Annual Report, 1939. Saginaw, Mich.: Department of Health, 1940. 57 pp.

YOUR HEALTH: A Guide to the Medicine and Public Health Building, New York World's Fair, 1940. New York: American Museum of Health, 1940. 96 pp.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Pro BCG—Unqualified support for BCG Vaccination is urged for babies born in households in which tuberculous patients reside, as the best possible protection. BCG is safe and confers immunity lasting two or more years says this Canadian proponent.

BAUDOIN, J. A. Vaccination against Tuberculosis with BCG Vaccine. Canad. Pub. Health J. 31, 8:362 (Aug.), 1940.

Still Our First Job—Declines in tuberculosis rates are due to a general lessening of infection. Among the tuberculous the death toll is still appalling. About half the infected individuals develop clinical tuberculosis, and from 10 to 20 per cent eventually die of the disease. Preventing infection remains the most pressing problem.

BOGEN, E. The Toll of Tuberculosis Infection. Am. Rev. Tuberc. 42, 2:253 (Aug.), 1940.

For Your Own Information—A carefully controlled study of heat-killed bacterial vaccine for the common cold made in a group of cold-susceptible students reveals that it is of no value.

DIEHL, H. S., *et al.* Cold Vaccines. J.A.M.A. 115, 8:593 (Aug. 24), 1940.

More and Better Public Hygiene—Briefly presented are some of the more numerous opportunities for effective life work in the public health field, and the need for adequate training to prepare for them.

DIEHL, H. S. Medical Careers in Public Health. J.A.M.A. 115, 5:343 (Aug. 3), 1940.

Despite Our Vaunted Sanitation—Probably there are 5 to 10 times as many outbreaks of disease due to faulty sanitation as ever get into the reports. New York State which has better than average sanitary supervision furnishes most of the reports even though it contains but a tenth of the total national population. If we knew how great a penalty we paid for our inadequate sanitary safeguards we might be more willing to improve them.

FRANK, L. C. Disease Outbreaks Resulting from Faulty Environmental Sanitation. Pub. Health Rep. 55, 31:1373 (Aug. 2), 1940.

Better Parents—A journal of heredity seems an unlikely spot in which to find a brief philosophic article on parenthood, but here it is. Less algebra and more physiology is urged upon our educators.

KOSMAK, G. W. The Responsibility of Parenthood. J. Heredity. 31, 6:297 (June), 1940.

The Great Social Adventure—Forty per cent of entering school children need more careful examination than they get in ordinary classroom observation, and children should be "readied" for first grade. How more of their emotional kinks might be unravelled is the theme of a preceding editorial.

LOWREY, L. G. Readiness for School. Understanding the Child. 9, 2:4 (June), 1940.

Personal Note—Freshly prepared vanishing cream containing an oxidizing agent, such as sodium perborate, rubbed into the exposed skin will protect against ivy poisoning. Directions for applying are given.

SCHWARTZ, L., *et al.* Protective Ointment for the Prevention of Poison Ivy Dermatitis. Pub. Health Rep. 55, 30:1327 (July 26), 1940.

Healthy Teeth—In this study of Forsythe Dental Infirmary children aged 4 to 13 years, it is found that those largely free from dental caries have better present and past health standards than those who enjoy high frequency of dental caries. Oral conditions may be regarded as symptomatic of the general health of the whole body.

SOGNNAES, R. F., and WHITE, R. L. Oral Conditions of Children in Relation to State of General Health and Habits of Life. Am. J. Dis. Child. 60, 2:283 (Aug.), 1940.

Making Communities Better and Safer Living Places—Some of the problems incident to the integration of a mental hygiene service in the existing community social agencies are analyzed, and the most promising procedures are suggested. A timely and important paper.

STEVENSON, G. S. Ways of Developing and Utilizing Psychiatry in Community Health and Welfare Programs. Ment. Hyg. 24, 3:353 (July), 1940.

Sweets vs. Teeth—Notable for coining the doubtful phrase "an unsweetened tooth will not decay," this radio talk tells about the now well known findings of the several Eskimo dental surveys in which the Eskimos living on a protein diet had perfect teeth while those who had access to store foods—including sugar, molasses, candy, etc.—had teeth as bad as their white neighbors.

WAUGH, L. M. An Unsweetened Tooth Cannot Decay! J. Am. Dental Assn. 27, 7:1124 (July), 1940.

Paradox—General trends of tuberculosis rates depend upon the nutrition of the bulk of the people and upon the sanitary and economic status of the nation. As national nutrition is lower in the predominently agricultural countries the tuberculosis mortality is higher there than in industrial states.

WOLFF, G. Tuberculosis Mortality and Industrialization. Am. Rev. Tuberc. 42, 1:1 (July), 1940.

For Better Rabies Vaccines—Only a limited number of antirabic vaccines are capable of immunizing mice against rabies. Much of the vaccine being sold has little antigenic value. A mouse test is urged for each batch as one method of bettering the situation.

WYCHOFF, R. W. G., and BECK, C. E. The Potency of Antirabic Vaccines. J. Immunol. 39, 1:17 (July), 1940.

ASSOCIATION NEWS

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

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Arthur L. Kaslow, M.D., Box 3006, Stanford University, Calif., Instructor in Hygiene, Dept. of Hygiene

Public Health Nursing Section

Ruth Albrecht, B.S., State Health Dept., Austin, Tex., Consultant in Nurse Education

Rowena Belden, 1 Frederick St., Hartford, Conn., Public Health Nurse, Bureau of Venereal Diseases, State Dept. of Health

Irene M. Donovan, R.N., Box 65, Bismarck, N. D., State Supervisor of Public Health Nursing, State Dept. of Public Health

Theodosia W. Flud, R.N., Box 470, Fayetteville, N. C., Supervising Nurse, City-County Health Dept.

Norma A. Michaelson, B.S., 200 E. Laurel, Fort Collins, Colo., Lorimer County Public Health Nurse

Dorothy E. Nehrkorn, R.N., B.S., 325 E. Broadway, East St. Louis, Ill., Chief Supervising Nurse, East Side Health District

Luella Olson, R.N., Touro Infirmary, New Orleans, La., Public Health Instructor for Student Nurses

Florence L. Phenix, R.N., Room 146, N. State Capitol, Madison, Wis., Supervisor, Crippled Children's Division, Bureau for Handicapped Children, State Dept. of Public Instruction

Epidemiology Section

Frederick G. Gillick, M.D., Room 18, Municipal Courts Bldg., St. Louis, Mo., Supervisor, Venereal Disease Control Section, Health Division

John A. Lewis, Jr., M.D., M.P.H., 2141 Baringer Ave., Louisville, Ky., Acting Director, Bureau of Venereal Diseases, State Dept. of Health

Fred G. Pegg, M.D., R.F.D. 5, Winston-

Salem, N. C., Venereal Disease Control Officer, Forsyth-Yadkin-Davie-Stokes County Health Dept.

Ira Leo Schamberg, M.D., Dept. of Dermatology & Syphilology, Univ. of Michigan, Ann Arbor, Mich., Research Associate in Syphilis, Univ. of Michigan Medical School

Benjamin Viel, M.D., 38 Seminario, Santiago, Chile, S. A., Epidemiologist, Public Health Service of Chile

Unaffiliated

Gladys P. Bell, A.B., P. O. Box 743, Boise, Ida., Medical Social Worker, Idaho Division of Public Health

James A. McVeigh, M.D., 3919 John R, Detroit, Mich., Diagnostician, Detroit Dept. of Health

Victor H. Vogel, M.D., U. S. Public Health Service, Washington, D. C., Consultant to States in Mental Hygiene

PROPOSED EIGHTH EDITION OF STANDARD METHODS FOR THE EXAMINATION OF DAIRY PRODUCTS

ALTHOUGH the seventh edition of this report was published in 1939 it is proposed to publish a new edition in 1941, when the present printing of the seventh edition will be exhausted. The primary purpose of the publication of a new edition is to make it possible to include the newly prepared sections covering methods for the examination of frozen desserts. This publication will also permit the introduction of various improvements in the technics for examination of milk and cream that have been tested during the period since 1939.

Mimeographed copies of the proposed methods for the microbiological examination of frozen desserts, including such ingredients as powdered milk, evaporated milk, condensed milk, gelatin, coloring solutions, flavoring extracts, nuts, fruits, sweetening agents, and egg products were distributed by the Committee on Methods for the Examination of Frozen Desserts to all who requested them in 1939. These manuscripts have been revised in the light of criticisms received during the current year, and are ready for presentation for approval at the Detroit meeting of the Association.

The Committee on Methods for the Examination of Dairy Products will, at the same time, ask that the incubation of agar plates at 32° C. (tolerance ± 1.5° C.) be made optional, thereby giving the approval of the Association to Departments of Health that have found it feasible and practical to introduce not only the new standard agar, but also 32° C. incubation. The directions for methods used for determining the sterility of bottles, cans, and other dairy utensils have been developed by W. von D. Tiedeman as *Referee*, into a separate section of the report. While there are no real changes in methods, directions have been prepared for examining paper milk containers, sanitary closures and bottle caps, ice cream freezers, and other equipment used in handling milk, cream, butter, and frozen desserts and their ingredients. Minor changes in other methods such as the application of the coliform technic to dairy products other than milk and cream, sediment testing, etc., will also be presented for approval at the Detroit Meeting.

Committee on Methods for the Examination of Frozen Desserts

F. LEE MICKLE, *Chairman*

Committee on Methods for the Examination of Dairy Products

ROBERT S. BREED, *Chairman*

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

POSITIONS WANTED

ADMINISTRATIVE

Experienced physician, graduate University of Illinois; M.P.H., Johns Hopkins, 1940; seeks administrative opening suitable to his proven ability. Excellent references. **A466**

Physician, M.P.H., Harvard, a student of maternal problems, wishes position preferably with teaching opportunities. **A461**

Administrative public health or epidemiological position is desired by well qualified physician, with M.P.H. degree, 16 years' experience as county and city health officer, and 3 years epidemiologist. **A206**

Physician, aged 40; M.D. and Dr.P.H., Yale University; with excellent training in medicine, pediatrics, and epidemiology; now specializing in public health education; will consider appointment in health education or administration. **A366**

Physician, 32; M.D., 1936; postgradute course in venereal disease control, experienced as district health officer and in organizing and publicizing syphilis control campaign; now employed in charge venereal disease clinics in metropolitan health department; seeks venereal disease control post with opportunity to organize or administer program. **A437**

A position in epidemiology or administrative public health is desired by physician with C.P.H. from Johns Hopkins, 11 years' administrative public health experience and excellent background of communicable disease control and school health service. **A368**

Physician, M.P.H., Harvard; well experienced in city and rural health administration; will consider appointment as district health officer or in city or state health department. **A418**

Unusually well trained physician, Dr.P.H., Harvard; background of laboratory research and experimental epidemiology; wishes opportunity to acquire field administrative experience under good auspices. **A460**

Woman physician; M.D., Cornell; M.P.H., Harvard; experienced in pediatrics; seeks administrative position. **A467**

Woman physician, graduate of University of Iowa, experienced as director of state bureau of maternal and child health, as well as health service director, seeks teaching position. **A318**

Woman physician, graduate of Boston University; special work Columbia and Massachusetts Institute of Technology; experienced as director of child hygiene and health in state university; seeks teaching position. **A469**

Physician, aged 32, graduate of Columbia University Physicians and Surgeons, New York, and M.P.H., Harvard, excellent clinical background; 2 years' field experience with modern department, will consider administrative, child hygiene or student health position. **A470**

Physician, M.D., Yale; M.S.P.H. Columbia; also short course for health officers, Vanderbilt; good clinical background; 3 years' public health experience; will consider appointment in child health, epidemiology or public health administration. **A350**

HEALTH EDUCATION

Young woman with splendid educational background, graduate of Massachusetts Institute of Technology health education courses; M.A., Columbia University; seeks position in health education or nutrition. **H462**

Experienced teacher in public health and author; M.A., Columbia; experienced in teaching public health nursing and carrying field promotion; wishes broad opportunity to train field personnel in extending knowledge and interest to the general public, especially through group education, institutes, exhibits, and rural programs. **H400**

LABORATORY

Experienced woman bacteriologist, Ph.D., University of Illinois, 1937, wishes position in teaching or research. Excellent bibliography and references. **L410**

Young man, bacteriologist, especially trained in viruses and rickettsiae and all phases of public health laboratory work; Sc.D., Johns Hopkins; now assistant state laboratory director; qualified to consider teaching, executive, administrative or research position; particularly interested in and qualified for practical laboratory methods with viruses; desires position. **L451**

Experienced bacteriologist, young man

of 33, Sc.B., who for several years has been in charge of state laboratory doing public health and diagnostic bacteriology, immunology and serology, will consider opening. **L427**

SANITARY ENGINEERING

Engineer, aged 38, 3 years' experience as district sanitation supervisor, state department of health, together with work on plumbing, heating and ventilation, will consider position in the plumbing and heating field or state department of health. Prefers middle western or western states. **E453**

Public health engineer, B.S. in Sanitary Engineering from Massachusetts Institute of Technology; experienced in Massachusetts, Connecticut and Kentucky, seeks position as sanitary or public health engineer with health department. **E380**

Engineer with good training and experience in water treatment, sewage plant operation and in research, wishes position as superintendent. Can go anywhere. **E422**

Public health engineering position desired by man with M.S. in Sanitary Engineering from Harvard, and 7 years' experience, including 4 years with state department as assistant engineer. **E468**

MATERNAL AND CHILD HEALTH

Physician, M.D., Class A medical school; training in obstetrics and public health; experienced as director of county health department; teacher of clinical obstetrics and administrator of state maternal and child health program; desires position in public health obstetrics or in maternal and child health administration. **C417**

Woman physician, with excellent medical training and background of public health nursing experience, seeks position in maternity and infancy work. **C376**

Government Seeks Part-Time Medical Officers

THE expansion of the Army creates a need for about 600 civilian medical officers in various grades for temporary and part-time service. The duties of full-time officers will be to act as doctors of medicine in active practice in hospitals, in dispensaries, and in the field. The duty of part-time officers will be to report for sick call at a fixed hour each day and to be subject to emergency call at all times.

The United States Civil Service Commission, in making this announcement, calls particular attention to the fact that part-time officers will be able to continue their regular practice. In order that this may be done, appointments to the part-time positions will be made of medical officers in the vicinity of the place of duty.

Information concerning these positions may be obtained from the Secretary of the Board of United States Civil Service Examiners at any first- or second-class post office, or from the United States Civil Service Commission, Washington, D. C. Physicians are urged to apply at once. This work is of the greatest importance to the success of the national defense program.

Advertisement

Opportunities Available

ASSISTANT DIRECTOR—Department of public health in university medical school; physician with Master's or Doctor's degree in Public Health required; experience should have included administrative work in health department; some teaching; about $4,000. PH10-1, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH PHYSICIANS—(a) To serve as county health physician in rural section of South; public health training available with all expenses paid to men interested in this field; salary upon appointment as county commissioner of health, $3,000, plus $600 travel allowance. (b) City health physician; western city having well established department of health adequately staffed; $3,600, plus $300 travel allowance. (c) City health physician; midwestern metropolis; no administrative work involved; $2,700. (d) Physician to direct venereal disease clinic, southern metropolis; initial stipend $3,600. PH10-2, Medical Bureau, Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIANS—(a) Western college with enrollment of over 4,000 students; student health experience not required; recent graduate eligible. (b) To assist director of student health service, midwestern university; $3,000 for college year of nine months, increasing to $3,500. PH10-3 Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSES—(a) Important supervisory position, city-county health department; nursing staff is amalgamation of visiting nurse association and city-county health department; healthful climate; beautiful location; population largely American; year of theory and public health nursing required; $175; adequate travel budget. (b) Supervisor county health department; minimum of fifteen credits in advanced public health training required; duties consist of assisting in local health program and participating in maternity and child health program; midwest. (c) One supervisor and two public health nurses; state department of health; supervisor must have speaking ability and be able to supervise eight nurses; midwest. (d) For tuberculosis educational program, midwest. PH10-4, Medical Bureau, Palmolive Building, Chicago.

HEALTH EDUCATION DIRECTOR — College graduate who has majored in public health and whose experience has included educational work; duties will be in connection with well established county tuberculosis society; $1,620, plus car allowance, increasing annually; 41 hour week; East. PH10-5, Medical Bureau, Palmolive Building, Chicago.

SCHOOL NURSE—Public health training required; $1,300, car allowance; vicinity Detroit. PH10-6, Medical Bureau, Palmolive Building, Chicago.

STUDENT COUNSELOR—Unique opening for personable young woman with college and nursing degrees; exclusive school for young women; South. PH10-7, Medical Bureau, Palmolive Building, Chicago.

BACTERIOLOGISTS—(a) Research appointment in state department of public health; Ph.D. or D.Sc. in one of the biologic sciences required; $3,000. (b) Instructorship in southern university; must be qualified to conduct laboratory sections in general bacteriology and teach a course in laboratory diagnosis; $1,600 plus $350 for summer session work, if desired. (c) Young bacteriologist for appointment in laboratory of experimental surgical bacteriology; midwestern university. (d) For teaching assistantship in bacteriology offering opportunity for advanced study and research in bacteriology; some teaching experience desirable; annual allowance of about $500. PH10-8, Medical Bureau, Palmolive Building, Chicago.

Positions Wanted

PUBLIC HEALTH PHYSICIAN—Well trained and experienced public health physician is available; B.S., M.D., midwestern university; C.P.H., Johns Hopkins; 10 years in public health administration; past several years, state director, division of venereal disease control; for further information please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Excellently trained public health nurse is available; A.B. degree, eastern college; graduate of school of nursing of university hospital; year's postgraduate training in public health nursing; is certified; nearly 15 years' executive experience in public health nursing; past several years, executive secretary, city health council; a very superior woman of broad and varied experience; has made distinct contribution to field of public health nursing; for further information please write M. Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Will receive degree of B.S. in public health nursing from large university in December; 2 years' nursing experience during interim between graduation from university school of nursing and enrollment in public health course; for further information please write M. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

NEWS FROM THE FIELD

U. S. PUBLIC HEALTH SERVICE OFFERS MENTAL HYGIENE CONSULTATION SERVICE TO STATES

THE United States Public Health Service has established a new office, Mental Hygiene Consultant to the States, for the purpose of encouraging and giving aid in the organization of state mental hygiene programs. Mental health projects will be recognized as approved objects for expenditure of Title VI Social Security funds allocated to state health departments for the extension of public health work. Passed Assistant Surgeon Victor H. Vogel will be in charge of the office.

THE PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY

THE first meeting of the Public Health Association of New York City for the 1940–41 season has been called for Tuesday, November 19, at 8:00 P.M., at the Russell Sage Building, 130 East 22 Street, New York.

Frank Kiernan, Secretary, announces that the session will center around "Echoes of the Annual Meeting of the American Public Health Association at Detroit." Dr. Arthur I. Blau, President of the Association, will preside. Speakers will include Dr. John L. Rice, Dr. Ira V. Hiscock, Dr. Helen C. Manzer, Sol Pincus, and Dr. Reginald M. Atwater.

The membership will be asked to vote on proposals to modify the By-laws so as to establish annual dues beginning with 1941. A further proposed revision of the By-laws, if adopted, will open the membership of the Association to all persons engaged in public health work in New York City and vicinity.

SOCIAL ASPECTS OF MEDICINE

A COURSE of six lectures on the social aspects of medicine will be given by Dr. C.-E. A. Winslow and Dr. Franz Goldmann of the Yale University School of Medicine at the New School for Social Research, New York City, beginning Thursday, October 3.

According to the announcement, Dr. Winslow will give the first and last lectures and that of October 17th. The course will examine the fundamental problem, the basic principles of social medicine, and the recommendation of the Committee on the Costs of Medical Care; it will discuss recent developments in the field and will outline a national health program.

DR. RENÉ SAND

ANY friends of DR. RENÉ SAND, Minister of Health in Belgium, will be glad to know that word has been received that he is safe in France.

It is also reported by DR. R. H. HAZEMANN, Provincial Health Officer for two areas near Paris, also well known in the United States, that much of the public health program is proceeding, especially an attack on alcoholism since the German occupation.

PERSONALS

Eastern States

LESLIE BAKER, who has been Director of Exhibits for the New York World's Fair, has been appointed Administrative Assistant on the executive staff of the new American Museum of Health to be opened in Flushing Meadow Park, New York City, next winter. Mr. Baker will be in charge of business affairs for the American

* Fellow A.P.H.A.
† Member A.P.H.A.

Museum of Health, which is expected to make its permanent home in the building now occupied by the Masterpieces of Art show on the grounds of the New York World's Fair.

ROBERT E. PLUNKETT, M.D.,† General Superintendent of Tuberculosis Hospitals of the New York State Department of Health, Albany, N. Y., left for the Dominican Republic during the last week of August, for the purpose of aiding that country in formulating an anti-tuberculosis program which will be carried out there over a period of years. He expected to return September 17.

DR. JOSEPH STOKES, JR., went by Clipper to France, August 4, to make a survey of the medical and public health needs of refugees in southern France under the auspices of the American Friends' Service Committee.

Southern States

KATHERINE BAIN, M.D., of St. Louis, Mo., has been appointed Director of the Division of Research in Child Development of the Children's Bureau, Washington, succeeding ETHEL C. DUNHAM, M.D.,† who will continue with the Children's Bureau in charge of special studies.

HARRY E. BARNES, M.D., Medical Director, District No. 1 Health Unit, Oklahoma, will attend the Johns Hopkins School of Public Health during the school year 1940–1941.

FRANK P. BERTRAM, D.D.S.,† of Oklahoma City, Director of the Oklahoma State Dental Program, will attend the Howard University School of Public Health during the school year 1940–1941.

JAMES O. HOOD, M.D.,† of Norman, Okla., Health Officer of Cleveland County, will attend the Johns Hopkins School of Public Health during the school year 1940–1941.

WILLIAM A. LOY, M.D., Health Officer of the Carter County Health Department, Oklahoma, will attend the Johns Hopkins School of Public Health during the school year 1940–1941.

VANCE F. MORGAN, M.D., of Oklahoma City, Director of the Bureau of Venereal Diseases, Oklahoma State Department of Health, will attend the Johns Hopkins School of Public Health during the school year 1940–1941.

DR. ROBERT L. RUSSELL, Chief of the Tuberculosis and General Medical Service at the Veterans Administration Facility, Oteen, N. C., retired from the Service recently.

IRVING E. SIMMONS, M.D., C.P.H.,† of Quincy, Fla., has resigned as Health Officer of Gadsden County, to become head of the new unit in Nassau County. DR. SAMUEL J. RAVITCH, of Peekskill, N. Y., is Acting Director in Gadsden County.

WILFRED N. SISK, M.D.,† recently on the staff of the Venereal Disease Medical Center, U. S. Public Health Service, Hot Springs National Park, Ark., has been appointed Health Officer of Buncombe County, N. C., to succeed the late HOWARD L. SUMNER, M.D.†

DR. DAVID B. SNELLING, of Butler, Ala., Health Officer of Choctaw County, has been appointed in charge of the unit in Greene County, with headquarters in Eutaw. D. D. BURKHALTER, M.D.,† of Montgomery, will be Acting Health Officer in Choctaw County until a permanent appointment has been made.

JOHN H. SOLOMON, M.D., of Nashville, Tenn., has been appointed Health Officer of the health unit in Marshall County, with headquarters in Lewisburg.

JAMES M. SUTER, M.D., M.P.H.,† of Jonesville, Va., has been appointed Health Officer of Washington County,

* Fellow A.P.H.A.
† Member A.P.H.A.

to succeed WILLIAM M. MOIR, M.D.,† of Bristol, who goes to Smyth County.

DR. WILLIAM P. TERRY, of Victoria, Va., has been appointed Health Officer in Charlotte County.

Western States

DR. KARL CHESTER GUMMESS, of Los Angeles, Calif., has been appointed Medical Director for the State Relief Administration, succeeding DR. ALBERT E. LARSEN, of San Francisco, who resigned recently to become Medical Director for the Agricultural Workers' Health and Medical Association.

† Member A.P.H.A.

DR. FRANK B. YOUNG, of Long Beach, Calif., has been made a member of the State Board of Health.

DEATHS

DR. GEORGE W. GOLER, of Rochester, N. Y., died September 18, at the age of 76 years. As Health Officer of Rochester, he established the first municipal milk station and prenatal clinics in the United States.

WILLIAM A. HOWE, M.D., LL.D.,† former New York State Medical Inspector of Schools, died September 11, on his 78th birthday.

DR. F. PARK LEWIS, of Buffalo, N. Y., Ophthalmologist, died September 10, at the age of 85 years.

CONFERENCES AND DATES

American College of Physicians—25th Annual Session. Statler Hotel, Boston, Mass. April 21–25, 1941.

American Association for the Advancement of Science. Philadelphia, Pa. December 27–January 2.

American Association of State Registration Executives. Detroit-Leland Hotel, Detroit, Mich. October 8–11.

American Dietetic Association — 23rd Annual Convention. Pennsylvania Hotel, New York, N. Y. October 20–24.

American Education Week (20th annual observance), November 10–16. Theme: "Education for the Common Defense."

American Library Association. Midwinter Conference, Chicago, Ill., December 27–30, 1940. Annual Meeting, Boston, Mass., June 19–25, 1941.

American Public Health Association —69th Annual Meeting. Book-Cadillac Hotel, Statler Hotel, Detroit, Mich. October 8–11.

American Public Welfare Association. Round Table and Annual Meeting. Washington, D. C. December.

American School Health Association. Book-Cadillac Hotel and Hotel Statler, Detroit, Mich. October 7–11.

American Social Hygiene Association. Book-Cadillac Hotel, Detroit, Mich. October 6.

American Society for Public Administration. Chicago, Ill. December 29–30.

American Society of Civil Engineers—Fall Meeting. Cincinnati, Ohio. October 16–18.

American Standards Association. New York, N. Y. December 11.

American Water Works Association:

Wisconsin Section — Hotel Manitowoc, Manitowoc, Wis. October 14–16.

Southwest Section — Mayo Hotel, Tulsa, Okla. October 14–17.

New Jersey Section—Madison Hotel, Atlantic City, N. J. October 18–19.

Kentucky-Tennessee Section — Lafayette Hotel, Lexington, Ky. October 21–23.

California Section—Los Angeles Biltmore Hotel, Los Angeles, Calif. October 23–26.

West Virginia Section — Prichard

Hotel, Huntington, W. Va. October 24–26.
North Carolina Section—Sir Walter Raleigh Hotel, Raleigh, N. C. October 28–30.
Four States Section—Hotel Du Pont, Wilmington, Del. November 7–8.
Minnesota Section—St. Paul Hotel, St. Paul, Minn. November 7–8.
Missouri Valley Section—Hotel Fontenelle, Omaha, Nebr. November 13–15.

Arizona Sewage and Waterworks Association — Fall Meeting. Safford, Ariz. October 4–6.

Association of Military Surgeons of the United States. Cleveland, Ohio. October 10–12.

Association of Women in Public Health. Hotel Statler, Detroit, Mich. October 9.

Association of American Medical Colleges. Ann Arbor, Mich. October 28–30.

Conference on Current Governmental Problems. Massachusetts State College, Amherst, Mass. November 15–16.

Dairy Industries Supply Association. Atlantic City, N. J. October 21–26.

Federation of Sewage Works Associations—First Annual Convention, in conjunction with the 1940 Annual Meeting of the Central States Sewage Works Association. Hotel Sherman, Chicago, Ill. October 3–5.

Florida Public Health Association. Tampa, Fla. December 5–7.

Indiana State Medical Association. French Lick Springs Hotel, French Lick, Ind. October 29–31.

Institute on Science and the Nation's Food. Wellesley College, Wellesley, Mass. October 24–26.

International Association of Milk Sanitarians. Joint Meeting with the New York State Association of Dairy and Milk Inspectors. Hotel Pennsylvania, New York, N. Y. October 17–19.

International Society for Crippled Children. Asheville, N. C. October 6–9.

International Society of Medical Health Officers. Hotel Statler, Detroit, Mich. October 7.

Inter-State Postgraduate Medical Association of North America—International Assembly. Public Auditorium, Cleveland, Ohio. October 14–18.

Michigan Public Health Association. Book-Cadillac Hotel and Hotel Statler, Detroit, Mich. October 7–11.

Michigan Society for Mental Hygiene, Inc.—Annual Conference. Grand Rapids, Mich. October 10–12.

Mississippi Valley Conference on Tuberculosis and the Mississippi Valley Sanatorium Association. Lowry Hotel, St. Paul, Minn. October 2–4.

Municipal Public Health Engineers. Hotel Statler, Detroit, Mich. October 6–8.

National Association of Public School Business Officials. Detroit, Mich. October 14–18.

National Chemical Exposition—sponsored by the Chicago Section of the American Chemical Society. Stevens Hotel, Chicago, Ill. December 11–15.

National Council of State Public Assistance and Welfare Administrators. Washington, D. C. December.

National Organization for Public Health Nursing. Hotel Statler, Detroit, Mich. October 7.

National Pest Control Association—8th Convention. Indianapolis, Ind. October 28–30.

National Recreation Congress—25th. Statler Hotel, Cleveland, Ohio. September 30–October 4.

National Restaurant Association. Chicago, Ill. October 7–11.

National Safety Council. Chicago, Ill. October 7–11.

National Society for Crippled Children —Annual Meeting. Asheville, N. C. October 6–9.

New Jersey Health and Sanitary Association, Inc. 66th Annual Meeting. Hotel Berkeley-Carteret, Asbury Park, N. J. November 15–16.

New School for Social Research, New York, N. Y. Course of 6 lectures on The Social Aspects of Medicine, by Dr. C.-E. A. Winslow and Dr. Franz Goldmann of Yale University School of Medicine. Beginning October 3.

New York State Association of Public Health Laboratories—Mid-year Meeting. Division of Laboratories and Research, New York State Department of Health, Albany, N. Y. November 1.

New York State Conference on Social Work. Hotel Pennsylvania, New York, N. Y. October 8–11.

Pacific Coast Plumbing Inspectors Association—11th Annual Convention. Sainte Clare Hotel, San Jose, Calif. October 10–12.

Pan-American Congress of Ophthalmology. Hotel Cleveland, Cleveland, Ohio. October 11–12.

Society of American Bacteriologists. St. Louis, Mo. December.

State Directors of Health Education. Book-Cadillac Hotel, Detroit, Mich. October 7.

State Directors of Local Health Services. Book-Cadillac Hotel, Detroit, Mich. October 10.

State Directors of Public Health Nursing. Book-Cadillac Hotel, Detroit, Mich. October 7.

Texas Public Health Association. Fort Worth, Tex. September 30–October 2.

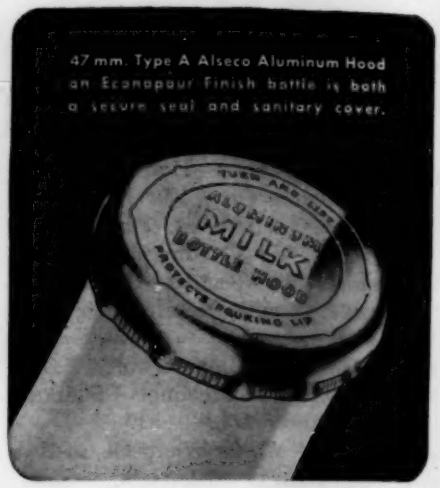
University of Chicago, Chicago, Ill. Fiftieth Anniversary Year: October 1, 1940–September, 1941.

West Virginia Public Health Association. Morgan Hotel, Morgantown, W. Va. October 31, November 1–2.

Western Governmental Research Association. Los Angeles, Calif. October 24–26.

Foreign

Pan American Congress of Tuberculosis—Fifth. Buenos Aires, and Cordoba, Argentina. October 13–17.



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